Margin Requirements and Volatility: Evidence from Canadian Stocks

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Abstract

Margin policy is used by regulators for the purpose of inhibiting excessive volatility and stabilizing the stock market in the long run. The effect of this policy on the stock market is widely tested empirically. However, most prior studies are limited in the sense that they investigate the margin requirement for the overall stock market rather than for individual stocks, and the time periods examined are confined to the pre-1974 period as no change in the margin requirement occurred post-1974 in the U.S. This thesis intends to address the above limitations by providing a direct examination of the effect of margin requirement on return, volume, and volatility of individual companies and by using more recent data in the Canadian stock market. Using the methodologies of variance ratio test and event study with conditional volatility (EGARCH) model, we find no convincing evidence that change in margin requirement affects subsequent stock return volatility. We also find similar results for returns and trading volume. These empirical findings lead us to conclude that the use of margin policy by regulators fails to achieve the goal of inhibiting speculating activities and stabilizing volatility.

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I. Introduction

The abrupt daily stock price fluctuations of the recent stock market crash of 2008 lead us to reexamine the role of margin requirements as a regulatory tool for stabilizing stock price variability. The major cause of the recent financial crisis is the sub-prime mortgage credit problem which arose in 2006, and led to a significant drop in housing prices in the U.S. The increased foreclosure rate and credit crunch initiated investment and commercial banking insolvency problems, accelerated margin calls, and eventually translated into a global financial meltdown. The Dow Jones Industrial index fell by 34.58 percent between the end of August 2008 and November 20, 2008. This market decline was accompanied by extremely high stock price volatility. For instance, the DJI experienced a single day positive return of 11.08 percent on October 13, 2008 and a negative return of -7.87 percent on October 15, 2008. Federal authorities took several measures to alleviate the scope of the problem. An economic rescue package of seven hundred billion dollars was approved on October 3, 2008. Prior to that, the Securities and Exchange Commission and the U.K. Financial Services Authority banned short sales of financial institutions shares on September 19, 2008. The objective of banning short sales can be found in the from the SEC release 34-58592 which states

> *"(A)s a result of these recent developments, the Commission has concluded that there continues to exist the potential of sudden and excessive fluctuations of securities prices generally and disruption in the functioning of the securities markets that could threaten fair and orderly markets.... In these unusual and extraordinary circumstances, we have*

concluded that, to prevent substantial disruption in the securities markets, temporarily prohibiting any person from effecting a short sale in the publicly traded securities of certain financial firms, which entities are identified in Appendix A ("Included Financial Firms"), is in the public interest and for the protection of investors to maintain or restore fair and orderly securities markets."

Banning short sales is similar to imposing an infinite margin requirement on short positions. Margin requirement in the U.S. has remained the same during the recent market crisis. The Federal Reserve did not attempt to directly control volatility by changing the level of margin requirement other than by banning short sales which is similar to increasing the requirement only on the sell side of the market.

In the U.S., the Securities and Exchange Act of 1934 empowered the Federal Reserve (the Fed) to set initial margin requirements for the purpose of limiting the amount of credit that is used in purchasing or carrying securities. The Fed has changed the initial margin requirement twenty-two times since 1934. However, the margin requirement has been fixed at 50% since 1974. This absence of change to the margin requirement may lead one to believe that the Fed has decided to abandon the use of margin requirement as a tool to stabilize market bubbles. Because of the absence of recent margin change, we cannot examine the effectiveness of margin requirement during the recent financial turmoil using data from the U.S. market. Thus, our study must be conducted using data from another financial market where margin changes took place recently.

In Canada, margin requirement is regulated by the Investment Industry Regulatory Organization of Canada (IIROC)[1], a national self-regulatory organization. The IIROC is empowered by all provincial securities regulatory authorities[2] and is overseen by the Canadian Securities Administrators (CSA)[3]. There are two main margin regulations for listed securities: Regulation 100.2(f)(i), and Regulation 100.2(f)(vi). Regulation 100.2(f)(i) applies to all stocks that are listed on an exchange in Canada or the U.S. In this regulation the level of margin requirement is a function of the market price of the listed securities. For example, in the case of buying on margin, the margin rate is set at 50 percent for securities that are selling above $2.00, whereas the margin rate is increased to 60 percent for securities that are selling between $1.75 and $1.99. Regulation 100.2(f)(vi) applies only to certain exchange listed stocks that are eligible for reduced margin at 30 percent. IIROC sets and publishes a list of companies that are eligible for a reduced margin requirement regularly. This list is known as the "List of Securities for Reduced Margin" ("LSERM"). IIROC adjusts the list quarterly by adding or deleting securities to the list of shares admissible to trade at lower margin requirement based on established criteria. These securities should meet some specific criteria in terms of risk, size, and performance. The LSERM provides an ideal setting for testing the effect of a margin increase from 30% to 50% (decrease from 50% to 30%) on the volatility of each company[4]. An increase (decrease) in margin requirement corresponds to deleting

[1] IIROC is the result of the consolidation of the Investment Dealers Association of Canada and Market Regulation Services Inc. in year 2008.
[2] Securities in Canada are primarily regulated by provincial and territorial regulations.
[3] CSA is voluntary organization of the 13 provincial and territorial commissions.
[4] We can also examine the change in margin of securities that are abided by Regulation 100.2(f)(i). However, the sample is restricted to include securities with market price around $2. These securities typically have small market capitalizations and exhibit high volatility in nature that could possibly create excess noise that alters the interpretation of our results.

(adding) a company from (to) the list. This list enables us to study the effect of change in margin requirement directly at an individual security level rather than the market level[5].

In this thesis, we take advantage of the unique margin requirement in Canada and employ a different approach in order to reexamine the effectiveness of margin regulation in today's stock market. In addition, the Canadian financial system is closely linked and similar in many ways to the American financial system. For example, there are many U.S. stocks that are interlisted on a Canadian stock exchange and vice versa. The U.S. and Canada are each other's main economic and commercial partner.[6] Because Canada has similar stock market characteristics to those of the United States, one can make an inference from the results achieved in the present study to the U.S. market. Furthermore, because this is the first study of the effects of margin requirements in Canada, we avoid the potential data snooping bias that could result from over-investigating the same U.S. dataset.

This thesis is organized as follows. Section II introduces the mechanics of margin. Section III discusses the theoretical linkage between margin requirements and volatility. Previous studies are reviewed in section IV. Section V presents the sample selection and data. Section VI presents various methodologies for empirical research. Empirical results are presented in section VII. The final section concludes this thesis.

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[5] Most previous studies are conducted on margin policies of countries where a single minimum margin requirement is applied to all securities listed on the markets. Thus, these studies focus on the effect of margin requirements on market volatility.

[6] See Sundell and Shane (2006).

II. Margin Mechanics

Margin is collateral that an investor is required to deposit in a margin account in order to open and maintain a position. An investor who desires to buy on margin needs to set up a margin account with his respective broker. Brokers set the initial margin rate at or higher than the minimum rate required by regulatory authorities. The minimum rate is referred to as initial margin requirement. The total initial margin rate is determined by the credit risk assessment of individual investors, and by the level of risk tolerance of the broker. The minimum required margin deposit in a margin account serves as collateral for the leveraged position. Brokers settle daily losses or gains through the margin account. Investors always need to maintain a minimum balance on this account at anytime. This minimum balance is called the maintenance margin. If the balance on the margin account falls below the maintenance level, the investor will receive a margin call. If he does not answer the margin call the broker is authorized to liquidate the position and to close the account. In order to explain the mechanics of margin, we can refer to an example. It is supposed that initial margin requirement is 50% and maintenance margin requirement is 25%. If an investor wants to purchase 100 shares of stocks at $100 per share on margin at a total value of $10000, he is required to deposit $5000 in his margin account. The loan extended by the broker is also $5000. When stock prices decrease by 40% the amount of collateral remaining on the account is reduced to $1000, and collateral falls below 25% of the value of the open position ($1000/$6000=0.167). The investor should receive a margin call and is required to either deposit cash in order to meet the initial margin requirement, or to close the open position at a loss.

Margin accounts are also used for short positions. An investor who expects stock prices to decrease would borrow a security and sell it on the spot market. He expects to purchase the same security at a lower price and to repay the loan at a later time. The loss on a short position can be unlimited. The broker asks for an additional deposit that is 100% of the initial short position on top of the regularly required margin rate for buying on margin. Similarly, to buying on margin, margin deposits in the margin account will serve as collateral for the security loan. Daily losses caused by a bull market are also settled through the margin account.

III. Theoretical Issues

Moore (1966) and Figlewski (1984) describe the main objectives of implementing a margin requirement. The first is to ensure credit and resources are allocated to productive economic activities that are not including speculation activities. The second is to prevent investors from taking extremely high leverages which may eventually be harmful to them. The third is to reduce the risk of price fluctuations which is driven by purchasing stock on credit. To meet these objectives, however, it is assumed that an investor will not seek ways to obtain credit to finance their stock purchases other than borrowing through margin account.

This thesis focuses on examining the third objective of margin requirement. The theoretical linkage between credit-financed stock purchase and price fluctuation can be explained by the pyramiding-depyramiding process. The pyramiding process is initiated by optimistic speculators who would borrow excessively to purchase stocks based on their optimistic beliefs. These excessive purchases in turn force the equity prices up to an artificial level that cannot be justified by the fundamental equilibrium. The overoptimistic speculators may reinvest their gains or even take more leveraged positions to ride the bubble. This mechanism, known as the pyramiding effect, is believed to have contributed to the high prices that prevailed during the pre-1929 crash when margins were not regulated. The irrational high price bubble is unjustifiable in the long run and will eventually burst. As stock prices go down, brokers require more collateral in their borrowers' margin accounts. If some leveraged investors are unable to meet the additional collateral requirement, brokers would liquidate their positions, pulling prices

down further. Moreover, bearish investors who favor short selling would seize the opportunity and sell more for a profit. This opportunistic selling causes prices to drop even further. This is called the depyramiding effect. The pyramiding-depyramiding process is believed to have caused the market crash of 1929. In response to this market crash, the 1934 U.S. Congress established federal margin authority to prevent unjustifiable increases or decreases in stock demand. They argue that the initial margin requirement can be useful as a tool for preventing dramatic price fluctuations by limiting credit-financed trades from both extreme views on the stock market: extreme optimists who buy on margin and extreme pessimists who short sell.

The main research question here is the following: could the authorities and the regulators have alleviated the impact of these wide market events on the market volatility by using margin requirements as a strategic and tactical tool? High volatility and erratic market swings indicate that the market is searching for the right direction to set value for the underlying economic entities. Can margin requirements be used to accelerate this search and avoid damaging massive price movements in either direction? In other words, can the Fed use margin requirements as a policy and an effective tool in controlling price volatility over time?

Does margin policy work? The experience of the Black Monday market crash on October 19, 1987 when the Dow Jones Industrial Average Index dropped by 22.6% in one trading day, has (re)heated a discussion among academic practitioners and regulators about the effect of margin policy to control the devastating effects of high volatility. This Market crash has renewed a prolonged debate on the effectiveness of the Federal Reserve's margin policy. A similar phenomenon was observed in 2000 with the bursting

of the dotcom bubble. With a high volatility period linked to a major correction in the market, voices claiming that the use of minimum initial margin requirement rates as an effective policy tool by the Fed are heard loudly. Opposing voices are also heard. For instance, in the April 10th 2000 issue of the Wall Street Journal and in the midst of the dotcom bubble, two views about the issue are expressed under a paper entitled: "Margin calls: Should the Fed step in?" In this article Robert Shiller answered "(Y)es, it may avert disasters." When making an argument about the pyramiding effect that contributed to high P/E ratios and dotcom bubble, he asserts:

> *"(I)n the midst of this record-breaking boom, the Federal Reserve Board remains silent about the speculative level of the market... This inaction is unfortunate... While the Fed should be very wary on principle of intervening in markets, increasing the margin requirement today would stand as a warning to investors not to leverage themselves up excessively and would work in the direction of cooling the market."*

On the opposing side, Bruce Bartlett opposes this approach and argues that letting the Fed intervene would make things worse. First, he argues that, *"considerable research shows that margin requirements have no impact on volatility"* However, Robert Shiller states that he found *"these studies not entirely convincing*" during his testimony before the Subcommittee on Domestic and International Monetary Policy of the House Committee on Banking and Financial services on March 21, 2000.[7] We will present some of the controversial empirical findings of various researchers in the next section.

[7] The testimony is available on http://financialservices.house.gov/banking/32100shi.htm.

IV. Literature Review

Several papers examine the impact of the change in margin requirements on the spot and futures markets. These two types of markets have their own specific margin requirements. Unlike the stock market, the margin requirement in the futures markets is regulated by the respective exchange where the contract is listed and traded. The futures exchanges raise (lower) the margin requirements in response to higher (lower) expected volatility and other criteria, whereas the Federal Reserve adjusts the margins in response to unjustified price levels (Hardouvelis, 1988). Furthermore, the futures exchanges usually set the initial margin requirement below 10% which is substantially lower than the 50% that has been set by the Federal Reserve since 1974. This chapter begins with the review of the literature on margin requirements in the stock markets, and then follows with the review of the requirements in the futures markets. The linkage between volatility and trading volume is reviewed last.

A. Margin, Leverage, and Volatility: Evidence from the Stock Markets

Moore (1966) and Officer (1973) are among the first to empirically test the impact of margin requirement on stock volatility. Moore (1966) finds that total margin loans are negatively correlated to the margin requirements and to the changes in stock price. This implies that an increase in credit buying stabilizes the market. An increase in credit leads to higher liquidity, because margin credit makes it easier for buyers to enter a position. Furthermore, the author finds that the serial correlation of returns increases after imposing margin requirements. This evidence suggests that binding margin requirements

magnifies the pyramiding-depyramiding effect. Thus, Moore concludes that margin requirement is not an effective regulatory tool for stabilizing the market fluctuation. Officer (1973) examines the relation between the change in standard deviation of the market return and the change in margin requirement. He concludes that "*margin requirements are not a generally effective means of controlling variability of the market factor*." However, it should be noted that Salinger (1989) points out that his conclusion is not totally consistent with his results.[8]

Sentana and Wadhwani (1992) use margin requirement rate and subtracted it from one as a proxy for margin credit and find that higher margin requirements do not reduce the negative serial correlation in stock returns. This evidence suggests that the Federal Reserve was not successful in controlling the depyramiding effect.

However, Luckett (1982) argues that the Federal Reserve's intention to set margin requirement is not to influence the volume of credit in the market. He proposes to use the equity ratio instead of the margin credit as a dependent variable for determining the effectiveness of margin requirement. He defines the equity ratio as the ratio of investors' fixed sum of money for investment to the value of all stock purchased. The level of margin requirement and control variables are regressed against the equity ratio and the corresponding results show that margin requirement is always positively correlated to the equity ratio. Thus, the author concludes that initial margin requirement is an effective tool for limiting the pyramiding effect.

A similar argument was formulated by Zhang, Seyedian and Li (2005). They examine the tripartite relationship between margin borrowing, market return and

[8] Officer's conclusion is based on the higher R^2 of the regression before the margin change than that of regression after the margin change. Salinger (1989) claims that higher R^2 can be caused by higher t-stat of the other control variable.

volatility. They find that the change in margin borrowing does not impact on future return, but that past return does affect current margin borrowing. Furthermore, both market return and volatility are positively correlated to past return. They argue that the positive linkage between margin credit and volatility is spurious because the past market returns served as a confounding variable which explains the relationship between margin borrowing and volatility.

The study conducted by Zhang et al was a response to Hardouvelis' (1988, 1990) who studied the effect of margin changes on stock market volatility by using regression analysis. Hardouvelis (1988) uses the standard deviation of monthly stock return as a proxy for market volatility. His results show a significant negative relation between margin requirements and volatility. Hardouvelis' papers have sparked an academic debate on the effectiveness of Fed policy on margin requirement. Schwert (1989), Kupiec (1989) and Hsieh and Miller (1990), point out that Hardouvelis' regression is spurious. Hsieh and Miller (1990) argue that "*regressing a highly autocorrelated series such as Hardouvelis' standard deviation on step functions such as margin level can produce a significant coefficient even if no true relation exists.*" Furthermore, using a GARCH-in-mean model, Kupiec (1989), finds no relation between margin requirement and stock return volatility. The specification of his model not only corrects the misspecification of Hardouvelis' (1988) model but also integrates with an economic equilibrium asset pricing model.

Schwert (1989), and Hsieh and Miller (1990) provide an alternative perspective on the Fed policy. Their empirical results show that margin requirement will tend to increase (decrease), when stock price is higher (lower) and volatility is low (high).

Essentially, the Federal Reserve its changes margin requirements in response to the change in volatility in the market. In other words, volatility leads margins, but not the reverse. The authors conclude that the Federal Reserve's margin requirement is not an effective tool to influence the volatility.

Ferris and Chance (1988) study the equality between pre-change variance and post-change variance by using an F-test and found that only 5 out of 19 margin changes are consistent with the Fed stated policy that increasing margin requirement can reduce the volatility. Hsieh and Miller (1990) argue that the F-statistic is only valid when the returns are normally distributed. Following Brown and Forsythe (1974)[9], Hsieh and Miller use the modified Levene statistic to test for the changes in daily standard deviations around margin requirement change. Their findings do not support the efficacy of using margin requirement to control volatility. In fact, all but one of 22 margin changes shows an increase in volatility when margin requirement decreases.

In a more recent paper, Hardouvelis and Theodossiou (2002) document an asymmetrical effect of initial margin requirements on stock volatility. Specifically, the level of margin requirement is negatively correlated with the level of volatility only during normal and bull markets[10]. According to their interpretation, a bull market implies extremely optimistic investors who cause excessive speculation in the market. A higher margin requirement reduces speculative activity and therefore reduces the pyramiding effect of stock prices. By the same token, during bearish markets, margins should be

[9] Brown and Forsythe (1974) suggest that to use a more robust estimator of central location rather than the mean in the Levene's statistic.

[10] Authors define bull (bear) market as a period with at least N consecutive positive (negative) monthly returns. Normal periods are those that are not classified as bull or bear periods. N ranges from 3 to 6.

lowered to increase the much desired liquidity. This conclusion is consistent with the Federal Reserve's intention in establishing margin requirement policies.

Because the same database which contains the twenty-two U.S. margin changes has been widely used, the need for a fresh and different dataset in order to reduce the data snooping bias is strongly felt. To this end, Hardouvelis and Peristiani (1989-90) examine the effectiveness of margin requirement on stock volatility in the U.S. as well as in the Japanese stock market. In their regression model, they include a control variable, change in stock returns, in order to identify the possible leverage effect. They argue that omitting the control variable will lead to model misspecification. They find a negative relationship between change in margin requirement and change in stock volatility. This evidence, as was the case for the U.S. for previous Hardouvelis research, suggests that margin requirement is an effective tool to control stock volatility in the Japanese stock market.

Lee and Yoo (1991) study the effect of margin requirement on stock volatility in the U.S., Japan, Korea, and Taiwan. They use the modified Levene statistic to test for the change in daily standard deviation 25 trading days before and after the margin requirement adjustment. They find significant results in one out of 22 margin changes for the U.S., two out of 32 margin changes for Japan, one out of ten margin changes for Korea and three out of 19 margin changes for Taiwan. These findings imply that margin requirement in those markets is not an effective tool for controlling stock market volatility. Furthermore, the authors suggest that margin requirement is associated with liquidity effect rather than speculative effect. The margin requirement increases trading costs in the market. The higher trading costs discourage new market participants from entering the market and encourage existing market participants to exit. Therefore, the

fewer the market participants there are, the lower the liquidity it is and the higher the volatility it is. Ruling out the speculative effect implies that the market is dominated by rational investors.[11]

The inconclusive empirical results of the relationship between margins and volatility may be explainable by a theoretical model. Kupiec and Sharpe (1991) explore the theoretical relationship between margin policy and stock volatility and show that the direction of relation varies according to the assumption of the model. Put simply, if the proportion of risk-tolerant investors in the model is stochastic and their levels of tolerance keep constant, a positive relationship between margin requirements and stock volatility will occur. Conversely, holding the proportion of risk-tolerant investors constant but allowing the level of their risk tolerance to vary, a negative relationship between margin requirements and stock volatility will occur.

B. Margin, Market Participant, Price Limit and Volatility: Evidence from the Futures Markets

Telser (1981) develops a theoretical model to show that an increase in margin on one of the securities in an optimal portfolio will lead to a reduction in the amount allocated to that security and to a decrease in the expected return of the portfolio. This effect implies that there is a decrease in both the trading activity and the liquidity, which in turn causes a decrease in price volatility.

Fishe, Golderg, Gosnell, and Sinha (1990) examine the relationship between margins and lagged price volatility using a large data set. They find a significant and positive relationship between these two variables which confirms the hypothesis that the

[11] Lee and Yoo (1993) reexamine their study using different methods and find similar results.

regulator uses of price volatility is a deciding factor in determining margins levels. These authors also examine the effect of margin requirement on price volatility. However, they find no consistent evidence of a relationship between margin changes and price volatility. As a result they suggest that, "*it would be unwise to rely on margins to reduce volatility.*"

Day and Lewis (1997) examine the relationship between implied stochastic volatility and changes in initial margin requirements in the crude oil future market. Their results show that the forward volatility increase (decrease) prior to the date of an increase (decrease) in margin requirement. This evidence suggests that the exchange adjusts the initial margin requirement in response to the change in volatility of the crude oil futures. The authors, however, find no consistent evidence to show that adjustment of the initial margin requirement affects the subsequent volatility. They suggest that future market volatility Granger-causes [12] initial margin requirements, rather than initial margin requirements Granger-causes future market volatility.

Hardouvelis and Kim (1995) examine the relationship between the change in open interest and the change in margins in eight metal contracts and find a significant negative relationship between these variables. Furthermore, they examine the relationship between the change in volatility and the change in margin requirement and find a positive relationship between these two variables. Their results provide two possible explanations. One possibility is that the exchange changes the margin requirement in response to the change in expected volatility. The other is that increases in margin requirement affect primarily rational investors, thus causing the increase in volatility.

Adrangi and Chatrath (1999) extend Haztmark's (1986) model to show that the time-to-maturity of a contact plays a significant role in determining the impact of margin

[12] See Granger (1969).

changes on trading volume. They use regression analysis to empirically test this relationship. They find that the impact of margin change on trading volume is greater when a future contact is closer to expiration. According to the authors, this suggests that margins impose a transaction cost rather than an opportunity cost from the perspective of traders.

Chen (2002) empirically tests the substitution effect between price limits and margin requirements. The author finds that there is a significant negative relationship between price limits and margin requirements. This evidence suggests that the imposed price limit reduces the effect on margin levels. The author also finds that the higher the price volatility, the higher the margin requirement in the future market.

C. Margin, Trading Volume and Volatility

Volume and volatility are strongly linked. Several empirical papers document the empirical relation between these measures. Gallant Rossi and Tauchen (1992) use daily New York Stock Exchange data to determine that there is an association between high trading volume and high price volatility during trading days. This contemporaneous relationship implies that a decrease in volatility may accompany a decrease in trading volume. Jones, Kaul, and Lipson (1994) argue that in fact it is the number of transactions, not the volume, that is linked to volatility. Volume is a function of average trade size and the number of transactions. The authors argue that previous studies find a positive relationship between volume and volatility primarily because the number of transactions, an underlying variable of the volume function, is positively correlated to volatility.

The volume-volatility relation can be explained through various competing non-necessary exclusive theories. First, the mixture distribution hypothesis (MDH) by Clark (1973) and Harris (1986) stipulates that both volume and volatility are strongly linked. The MDH assumes that both volume and volatility are drawn from distributions based on a mixing variable. This latent variable is usually the arrival of new information that causes prices to change and investors to trade. The heterogeneity of beliefs (Harris and Raviv, 1993; Shalen, 1993) theory stipulates that the wider the dispersion of opinions between traders, the greater the volatility and price change associated with increased trading volume.

Anderson (1996) modified the MDH to allow for information to be the latent variable linking or mixing the volume and the volatility. His empirical results support this modified model and explain the link between both measures. However, Darrat et al (2003) assert that there is no contemporaneous relation between volume and volatility but instead lead and lag relations which favor the sequential information arrival hypothesis as opposed to the MDH.

As the current thesis investigates the relation between margin requirement and volatility and whether using the margin as a tool to control market volatility is effective, one can infer that trading volume is likely to be affected if the policy is successful. To illustrate, let us assume that the volatility is currently high and that regulators decide to raise the margin in order to reduce the volatility pressure. Margin increase reduces the incentive and the opportunity for enthusiastic buyers and/or short sellers to trade and therefore leads to lower trading activity. One can expect contemporaneous volatility to fall in this case due to the fact that trading activity and volatility are strongly linked.

V. Sample Selection and Data

The regular mandated margin requirement on the Canadian stock market is similar to that of the U.S. at 50%. However, there are securities that are admissible for trading at a lower margin requirement. Since June 30, 2000, the Investment Industry Regulatory Organization of Canada (IIROC) has been responsible for establishing a list known as the "List of Securities Eligible for Reduced Margin" (LSERM)[13]. Securities on this list can be traded at a margin of 30% compared to the regular mandated 50% for the remaining securities. The IIROC updates the list on a quarterly basis. Along with the list itself, the IIROC enumerates the criteria that a security should meet in order to be considered for inclusion in the reduced margin select list. The selection criteria are stated at the end of the published list itself. Appendix I of this thesis reproduces these criteria. When the IIROC judges that a security previously eligible for trading at reduced margin fails to satisfy the minimal margin conditions, it will delete it from the list. This means that it will revert back to trading at the regular mandated margin of 50%. Hence, addition (deletion) to (from) the list corresponds to a decrease (increase) in the required minimum margin from 50% (30%) to 30% (50%). This is a natural setting in which to test of the effect of "change in margin requirements" on various outputs including the volatility and trading activity after the treatment which is the change in the required margin.

For the remainder of this thesis, the terminology addition (deletion) refers to an observation that experiences a required margin rate decrease (increase).

[13] Prior to this new list, the Canadian Derivatives Clearing Corporation had been producing a list known as the "List of Option Eligible Securities", which used a different methodology to determine the eligibility of a security for trading at a reduced margin.

Our sample covers all IIROC announcements from June 30, 2000 to July 5, 2007. During this time period, we collect the records of newly added securities quarterly, as well as those deleted from the list. Our initial sample contains 4,974 additions and deletions in the period under investigation. In some cases, a security experiences multiple moves on and off the list over a short period of time. For instance, Amica Mature Lifestyle (TSX: ACC) was added to the LSERM on July 5th, 2007 and then deleted on September 13th 2007. The overlap which can exist in post addition and pre-deletion is clear from this example.

As the same data will be used for both increases and decreases in margin requirement due to the overlap, sample independency is not assured. We therefore delete any observation with overlapping data. In choosing the length of the time period pre and post addition/deletion from the list, a trade-off between robust estimates and a larger sample size is offered. We use data from over 180 calendar days pre and post addition/deletion to define each period which corresponds to twice the frequency of updating the list. To ensure proper calculation of the return's volatility, we exclude any observation that contains less than 100 daily returns in either of the pre or post margin change period. We also exclude any observation/security that has an average trading price lower than $1.[14]

In this thesis, we concentrate on investigating Canadian common equities, therefore the shares listed in non-Canadian currency and non-common equity instruments,

[14] Penny stocks have higher price volatility, trading costs and usually represent small companies. We acknowledge that this filter may impact more the deletion that the addition group of securities as high volatility and small market cap are reasons used by IIROC to cut securities from the list. However most of these securities create noise in the sample through frequent shifts from/to the list and reduce the samples independence. Moreover, most of the penny shares are thinly traded and are therefore ignored because of the minimum trading activity filtering rule we use.

including preferred shares, notes, debentures, and warrants, are excluded in our sample. We also exclude merged, acquired, reorganized, delisted, and bankrupt companies because they present a natural and clear problem when computing the volatility and when linking the change to the addition/deletion decision by the IIROC. For instance, deleted, bankrupt and liquidated companies do not present returns to compute volatility while returns for merged companies do not reflect the added/deleted firms but rather the combination with a second and different company. This makes the comparison between pre- and post-period difficult. The final sample contains 875 observations with 710 additions and 165 deletions.

Table 1 shows the distribution of the additions and deletions over the period under study. In the final sample, the number of securities that are added to the list is higher than that of those that are deleted from the list every year. This result is expected since we excluded many restructuring companies from our deletion list. Table 1 shows large time series variation in the number of additions or deletions. Panel A relates to the initial raw sample while panel B describes the distribution of the filtered sample used for the present study.

We can see that the year 2005 (2007) experienced the most the number of additions (deletions) to our initial raw sample at 507 (536). By looking at more recent data that is beyond the period under investigation for the present thesis and that is the unfiltered sample of observations, we see that the number of additions decrease from a high of 507 in 2005 to 313 in 2008. In the meantime, the number of deletions exploded to a record 563 in 2008 compared to 320 for the year 2005. The recent market turmoil is probably the main reason for this change seeing as volatility increased while market

capitalization decreased as a result of the negative returns. Both are criteria used by the IIROC to justify deletion from the list.

Table 2 reports descriptive statistics about the companies for addition and deletion groups. Monthly closing share prices, returns, the number of trades, trading volume, the number of shares and the shares outstanding are measured over the seven months preceding addition/deletion and are collected from the Canadian Financial Markets Research Center (CFMRC) database. Total assets and leverage as measured by total assets over total liabilities refers to the most recent annual financial statement released before the addition/deletion publication date and are collected from Compustat. Data from the System for Electronic Document Analysis and Retrieval (SEDAR) filing system was used to supplement information that could not be retrieved from Compustat.

Panel C of this table provides statistical inferences regarding on the difference between the sample of added and deleted shares to the IIROC list using a t-test (Wilcoxon/Mann Whitney) for mean (median) equality. We can conclude that the average added company performs better than the average deleted company with a difference in mean return of 6.5% per month for the seven months preceding inclusion/deletion to the list. The mean negative return of 2.5% for deleted firms indicates that they experienced poor stock performances prior to deletion from the list.

The median added company has a higher trading activity compared to the median deleted company with a median number of transactions 811 per month compared to 494. The same conclusion is drawn from the volume as measured by number of shares. Although there is an indication that the average deleted firm has higher leverage and is as a result

riskier than the added firm, statistical inference shows no significant difference because extreme outliers with high leverage are the cause.

VI. Methodology

The main objective of this thesis is to measure the impact of a lower margin requirement on returns' volatility. To that end, we first use a variance ratio test to compare pre- and post-change in margin volatility. Secondly, we use an event study methodology to account for changes in returns, volume and volatility around changes in margin requirements. We allow for volatility to be time-varying using an ARCH-like model to test for volatility jumps around the addition/deletion time. These two methodologies are developed in the next subsections.

A. Variance Ratio Tests

For each observation, we determine a pre- and post-mandated margin requirement change. The pre (post) period corresponds to a window covering 180 calendar days before (after) the announcement of the margin. We compute the variance of daily returns for each of these windows separately. We then compute the ratio of these variances for each observation. The variance ratio is computed as follows:

$$VR_i = \frac{{\sigma^2}_{i,pre}}{{\sigma^2}_{i,post}} \tag{1}$$

Where

$${\sigma^2}_{i,pre} = \frac{\sum_{t=1}^{n_{i,pre}} (r_{i,pre,t} - \bar{r}_{i,pre})^2}{n_{i,pre}}$$

$$\sigma^2{}_{i,post} = \frac{\sum_{t=1}^{n_{i,post}} (r_{i,post,t} - \bar{r}_{i,post})^2}{n_{i,post}}$$

$$\bar{r}_{i,pre} = \frac{\sum_{t=1}^{n_{i,pre}} r_{i,pre,t}}{n_{i,pre}}$$

$$\bar{r}_{i,post} = \frac{\sum_{t=1}^{n_{i,post}} r_{i,post,t}}{n_{i,post}}$$

$r_{i,pre,t}$ is the return for observation i on day t during the pre-announcement period. $r_{i,post,t}$ is read similarly. $n_{i,pre}$ is the number of daily returns of an observation before the change in margin requirement. $n_{i,post}$ is read similarly. This variance ratio will be tested for statistical significance at a level of 5% in comparison with the critical value of $F_{n_{i,pre}-1\,.n_{i,post}-1}$.

The null hypothesis is that the variance of returns is the same in the pre- and post-margin change periods. If margin requirement changes do not impact volatility, then one should expect the ratio not to be significantly higher or lower than one. Therefore, we test whether the variance ratio is different from one. Under regular conditions, the variance ratio follows an F-distribution. These conditions include normally distributed returns and independence between the numerator and the denominator of the variance ratio.

Brown and Forsythe (1974) argue that when the underlying distributions are non-normal, one should replace the mean with a "*more robust estimate of central location*" to compute the variances. Hence, we rely on a modified Levene's statistic where the mean is replaced with the median, and a central location estimate that is more robust to outliers. The modified Levene statistic is computed as follows:

$$W_i = \frac{\left[n_{i,pre}(\bar{z}_{i,pre.} - \bar{z}_{.\,.i})^2 + n_{i,post}(\bar{z}_{i,post.} - \bar{z}_{.\,.i})^2\right]\left[(n_{i,pre} + n_{i,post} - 2)\right]}{\left[\sum_{t=1}^{n_{i,pre}}(z_{i,pre,t} - \bar{z}_{i,pre.})^2 + \sum_{t=1}^{n_{i,post}}(z_{i,post,t} - \bar{z}_{i,post.})^2\right]} \quad (2)$$

where

$$\bar{z}_{i,pre.} = \frac{\sum_{t=1}^{n_{i,pre}} z_{i,pre,t}}{n_{i,pre}},$$

$$\bar{z}_{i,post.} = \frac{\sum_{t=1}^{n_{i,post}} z_{i,post,t}}{n_{i,post}},$$

$$\bar{z}_{.\,.i} = \frac{\sum_{t=1}^{n_{i,pre}} z_{i,pre,t} + \sum_{t=1}^{n_{i,post}} z_{i,post,t}}{n_{i,pre} + n_{i,post}},$$

$$z_{i.pre,t} = \left|r_{i,pre,t} - r'_{i,pre}\right|,$$

$$z_{i,post,t} = \left|r_{i,post,t} - r'_{i,post}\right|,$$

$r'_{i,pre}$ is the median of return for observation i during the pre-announcement period, $r'_{i,post}$ is the median of return for observation i during the post-announcement period, and $n_{i,pre}$ *and* $n_{i,post}$ are as described above.

Each test statistic, W_i, is asymptotically an $F_{1,n_{i,pre}+n_{i,post}-1}$ distribution.

B. Event Study Methodology

The main purpose of event studies is to capture the impact of an (possibly exogenous) event on the value of a company or any other variable of interest. In the present case, there is a clear definition of what an event is. We consider the publication of the list as the event to investigate. Usually the IIROC simultaneously announces and publishes the list of securities trading at lower margin requirement. The date of the announcement is therefore the date of the publication of the list itself. However, trading

at the new margin will commence exactly ten business days after the announcement and publication of the list.[15] We can therefore separate the announcement date from the effective date of the event and independently test for the impact of both events. While we expect any valuation effect to be dissipated around announcement dates as market efficiency hypothesis predicts, common sense dictates that trading activity effect will be noticed only when trading at the new margin starts around the effective date.

B.1 Return and Volatility Effects

Traditional event study methodology, introduced by Fama et al. (1969), is widely used to examine the impact of an event on the value of a firm. Basic event studies adjust for normal expected returns assuming that the volatility is constant. This is precisely what we want to avoid as the objective is to measure the change in volatility. We use an ARCH like model to account for conditional heteroskedasticity in the returns. More specifically, we use a GARCH-based event study approach to quantify the impact of changes to the required margin on the expected return and volatility simultaneously. We employ mainly the E-GARCH (Nelson 1991) model to fulfill this purpose. We use a market model[16] to fit daily returns for each security in our sample. The market model is as follows:

[15] Starting from the November 2008, the difference between effective and announcement dates is 15 business days.

[16] In addition, we estimate the market model using only non-financial stock returns. The results are reported in Appendix II and Appendix III. We also estimate the market model with an additional control variable, the Industrial index, in the return equation. The results are reported in Appendices IV and V. In both of these alternative estimations, the obtained results are qualitatively similar to those of the original market model.

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \lambda_{i,1} ANN_{i,t} + \lambda_{i,2} EFF_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$\varepsilon_{i,t} = \sqrt{\sigma_{i,t}^2} e_{i,t} \quad (4)$$

Where $r_{i,t}$ is the return on observation i during day t, $r_{m,t}$ is the return on the CFMRC over \$2 value weighted stock index during day t, $\varepsilon_{i,t}$ is the zero-mean unexpected return, $\sigma_{i,t}^2$ is the conditional variance of the return of firm i at time t, $e_{i,t}$ is an i.i.d. white noise process with zero mean and unit variance, $ANN_{i,t}$ is a dummy variable for observation i that takes the value 1 the day before, the day of and the day after the margin change announcement and zero elsewhere. $EFF_{i,t}$ is a dummy variable for observation i that takes the value of 1 the day before, the day of and the day after the margin change becomes effective and zero elsewhere.[17]

As a market proxy, we use the CFMRC over-\$2-index as we delete penny shares from our sample. As an alternative and for robustness analysis, we also use the global CFMRC index with all traded securities included.

Because we are not exactly sure about the actual timing of the release of the list of securities eligible for reduced margin, we allow for date indeterminacy by considering an announcement window of three days centered on the published announcement date. We do the same for the effective date.

The two parameters of interest in the return equation are $\lambda_{i,1}$ and $\lambda_{i,2}$. They show whether margin requirement changes are associated with any abnormal returns at the

[17] We can also use conditional event study methods (e.g. Prabhala, 1997) to examine the impact of the margin change on the value of stocks that are added (deleted) to (from) the LSERM. However, we are more interested in volatility.

announcement and effective day of margin changes. Our approach with regard to the announcement and effective windows can be assimilated to a restricted model. In fact, we assume that the abnormal return is constant and equal to $\lambda_{i,1}$ for each of the three days of the announcement period. This restriction does not strongly impact our inferences as we are more interested in the cumulative effect over the three days which is compounding to three times the point estimate of $\lambda_{i,1}$.

The conditional variance equation in the EGARCH (1,1) model is characterized as follows:

$$\ln(\sigma_{i,t}^2) = w_i + \varphi_i \ln(\sigma_{i,t-1}^2) + \theta_i \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} + \delta_i \left|\frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}}\right| + \phi_i POSTANN_{i,t} \qquad (5)$$

Where $w_i, \varphi_i, \theta_i, \delta_i$, and ϕ_i are parameters to be estimated, $\sigma_{i,t}^2$ is as above, $POSTANN_{i,t}$ is a dummy variable for observation i that is equal to 1 starting one day before the margin change announcement date and onward and zero elsewhere.

The E-GARCH specification has the advantage of *(i)* allowing for the leverage effect to be estimated separately through θ_i and *(ii)* does not require the imposition of restrictions on the parameters to ensure that $\sigma_{i,t}^2$ is always positive. The presence of leverage effect is associated with negative θ_i estimate. Negative surprises would have a higher effect on volatility than positive surprises with similar absolute magnitude. As returns become negative, almost only equity is diminished when compared to liabilities. Therefore leverage ratio increases and the firm becomes riskier.

The main parameter of interest is ϕ_i which measures the jump in volatility after changes in margin requirement. ϕ_i is the volatility jump assuming that it will prevail for a longer term.

The parameters of the system (3) (4) (5) can be estimated by the maximum likelihood method under the assumption of conditional normality of residuals. However, when this assumption does not hold, the standard errors estimates will be inappropriate. In the context of non-normality, a quasi-maximum likelihood method as in Bollerslev and Wooldridge (1992) should be employed to provide a robust covariance matrix estimator and standard errors. Both estimation methods are used in this study.

We use an aggregate t-statistic to gauge the statistical significance of our estimated parameters at the cross-sectional level. To show the construction of this aggregated t-statistic, we first consider the following t-statistic:

$$t = \frac{\frac{1}{n}\sum_{i=1}^{n}\hat{\gamma}_i}{\sqrt{var(\hat{\gamma})}/\sqrt{n}} \qquad (6)$$

where $$var(\hat{\gamma}) = \frac{\sum_{i=1}^{n}(\hat{\gamma}_i - \frac{1}{n}\sum_{i=1}^{n}\hat{\gamma}_i)^2}{n-1}$$

$\hat{\gamma}_i$ represents one of the estimated parameters (e.g. ϕ_i) of firm i and n is the number of observations or sample size. This basic t-statistic does not account for standard errors of the estimated coefficient from the time series regression. The potential problem with this t-statistic is that it may yield an incorrect inference and significance level when the estimated parameters across all cross-section observations are very close to each other so

that the cross-section variance of estimated parameters is low. To avoid this potential problem we can use the following test statistic that incorporates the reliability of the estimated coefficient:

$$t = \frac{\frac{1}{n}\sum_{i=1}^{n}\hat{\gamma}_i}{\sqrt{\frac{1}{n}\sum_{i=1}^{n} var(\hat{\gamma}_i)}} \quad (7)$$

Note that $var(\hat{\gamma}_i)$ in equation (7) is the square of the standard error of the estimated parameter in the time series regression. This cross-sectional t-statistic is an aggregate of all individual t-statistics in an equally weighted structure. In this equally weighting scheme, all individual t-statistics are treated similarly regardless of their respective degree of precision of estimation. In this thesis, instead of using the equal weighting structure we compute the aggregated t-statistic while allowing for more precisely estimated parameters to have higher weights. Practically, we use the following approach:

$$t = \frac{\sum_{i=1}^{n} w_i\hat{\gamma}_i}{\sqrt{\sum_{i=1}^{n} w_i^2 var(\hat{\gamma}_i)}} \quad (8)$$

Where $w_i = \frac{[var(\hat{\gamma}_i)]^{-1}}{\sum_{i=1}^{n}[var(\hat{\gamma}_i)]^{-1}}$ is the weight for observation i and is inversely related to its standard error.

B.2 Volume Effects

In this section we analyze the change in trading activity around the effective day of margin change. Our measure of trading activity is volume turnover, which is defined as the ratio of traded shares to total outstanding shares. To account for expected normal

turnover, we use a "market model" to fit daily volume turnover for each security in our sample.

For each security in our Addition sample, the specification of the model is as follows:

$$Volturnover_{i,t} = \alpha_i + \beta_{i,0} Volturnover_{m,t} + \beta_{i,1} D1_{i,t} + \varepsilon_{i,t} \quad (9)$$

For each security in our Deletion sample, the specification of the model is as follows:

$$Volturnover_{i,t} = \alpha_i + \beta_{i,0} Volturnover_{m,t} + \beta_{i,2} D2_{i,t} + \varepsilon_{i,t} \quad (10)$$

Where $Volturnover_{i,t}$ is the volume on observation i during day t divided by the outstanding shares of the respective month, $Volturnover_{m,t}$ is the equal-weighted volume turnover of all domestic common equities on TSX during day t, and α_i, $\beta_{i,0}$, $\beta_{i,1}$,and $\beta_{i,2}$are unknown parameters. $\varepsilon_{i,t}$ is the residual unexpected turnover with zero-mean disturbance and constant variance.

$D1_{i,t}$ is a dummy variable for observation i that takes the value of 1 the day before, the day of and five days after the effective date and zero elsewhere.

$D2_{i,t}$ is a dummy variable for observation i that takes the value of 1 five days before, the day of and one day after the effective date and zero elsewhere.

Construction of $D1_{i,t}$ and $D2_{i,t}$ is based on broker-dealer behavior when adopting new margins. After the announcement date, the broker-dealer may choose to increase margin requirement sooner for companies that are about to be deleted. $D2_{i,t}$ accounts for the effect of increases in margin requirement before the effective date. For companies that

are announced to trade at a lower margin, the change in margin requirement takes effect only when the broker-dealer adopts the new reduced margin on or after the effective date. $D1_{i,t}$ accounts for this effect on and after the effective date.

We estimate the above linear equations (9) and (10) using the Ordinary Least Squares (OLS) method. Our parameters of interest are $\beta_{i,1}$ and $\beta_{i,2}$ which show the abnormal trading turnover around the effective date of margin change. Similar to section VI B.1, we also use precision based aggregate t-statistics for our hypotheses testing.

VII. Empirical Results

In this chapter, we present our main empirical findings for the various tests presented in chapter 4. We first report the results of the variance ratio tests. Next, we show the results from using the alternative event-study methodology.

A. Variance Ratio Tests

This subchapter presents and interprets the empirical results of the variance ratio tests. We categorize margin change into two sub-samples namely the margin increase and the margin decrease samples. We conduct the ratio tests, as well as report and discuss the corresponding results separately for both samples.

A.1 Margin Decreases (Additions)

Panel A of table 3 reports the results of the simple variance ratio test for the scenario of margin decrease. We dichotomize our results into three parts. When variance ratio (pre/post) is significantly less than 1, we interpret this as supporting the margin requirement as a tool to reduce volatility. Inversely, when variance ratio is significantly greater than or equal to 1, we interpret this as not supporting the stated hypothesis. All individual tests use a significance level of 5%. Panel A shows that only 171 cases out of a total of 710 display an increase in the volatility after margin reduction from 50% to 30%. For most observations, i.e. in 317 cases or 45% of the sample size, no significant change in volatility occurs after margin reduction. Moreover, 222 observations or 31% of sample

size document a decrease in the volatility which opposes the view that by decreasing margin requirement volatility is increase because trading at both extremes of the distribution (buyers on margin and short sellers) are given higher incentive to trade. These individual results favor the theory that there is no effect or a decrease in volatility as a consequence of a decrease in margin requirement. Investigating this issue more closely, we look at the cross-section distribution of the individual F-statistics. Panel B of table 3 reports moments and percentiles of this distribution. The mean and median F-stats are respectively 1.26 and 1.06 with a standard deviation of 0.96. The wide distribution can be inferred from the range of the F-stat itself with a minimum value of 0.10 and a maximum of 10.93. Given this wide distribution, both mean and median are statistically significantly different from 1. One tail tests support that both are higher than one. This result confirms that a margin reduction in Canada actually leads to a fall in the volatility.

Given the discussion on the robustness of the usual F- or Bartlett test for the equality of the variance with non-normal data, we use a modified Levene test as an alternative with the median used as measure of central location instead of the mean. Panel C reports the results using this methodology. As suggested by Brown and Forsythe (1974), the usual mean based test suffers from rejecting the equality more often than the nominal size of the test suggests. In our case, the proportion of no significant change in volatility increases from 45% when using regular F-test to 69% when using the modified Levene test. Only 13% of the sample corresponds to the case where volatility increases after a margin fall.

On the basis of these evidences one may deduce that there is little to no evidence that stock volatility actually increases as margin requirement decreases (negative relation) as suggested by the theory about using margin requirement to control market volatility.

A.2 Margin Increases (Deletions)

Margin increase corresponds to deletion from the list of securities eligible to trade at lower than regular margin. Panel A of Table 4 presents the results for this sample. Similar to the previous sub-section, we present the distribution of the cross-section statistics in terms of the frequency of (i) of evidence indicating a decrease in the volatility, (ii) evidence indicating an increase in the volatility and finally (iii) evidence indicating no change in the volatility as a result of an increase in the margin requirement from 30% to 50%.

Panel A shows that for 56 of 165 observations or 34% of the total sample size, margin increase is not associated with changes to volatility. However, 45.45% of cases or 75 observations document an actual decrease in the volatility, which may be interpreted as supporting the use of margin requirement as a tool to reduce volatility when needed. 34 observations or 20.61% of the sample shows the opposite. Again, we rely on the cross-section distribution to make a global inference. The F-stats range from as low as 0.18 to 12.98 with a standard deviation of 1.32. Mean and median are at 1.37 and 1.58. Despite the wide range and high dispersion, both the mean and the median are significantly different and higher than the value under the null hypothesis of one as indicated by the parametric t-statistic of 5.64 and the non-parametric Wilcoxon test with a test statistic at

6.13. This is clear evidence that on average, volatility tends to fall after a margin requirement increase.

The modified Levene test, while failing to reject the null as more often as expected, still shows that for 28% of the sample or 46 cases there is a fall in the volatility after margin increase.

Overall and factoring in all these tests, one can conclude that there is weak evidence to prove that margin requirement increases are associated with decreased volatility.

B. Event Study Methodology

We will present the empirical results first for the case of margin decreases, then for the case of margin increases. For both samples, only results with respect to the coefficient of interest to us are reported. Tables 5 to 8 present the cross-section of the results. As we use numerical procedure to estimate systems (3) (4) and (5), results correspond only to the cases where convergence was achieved. To maximize the likelihood function we use both the Marquardt and the Berndt Hall Hall and Hausman (BHHH) algorithms.

B.1 Margin Decreases (Additions)

Table 5 reports the results of estimating the E-GARCH model formed by (3) (4) and (5) for the 710 observations that are in the addition sub-sample. Specifically, we report in Panel A of table 5 the cross-section distribution of the parameter $\lambda_{i,1}$ which

measures the abnormal return upon announcement of inclusion in the list of securities eligible for reduced margin. We also report the proportion of significant abnormal returns whether they are positive or negative. We also split our sample also according to 10 activity sectors as defined by the GICS codes and by the market capitalization of their respective issuing companies.

Overall, $\lambda_{i,1}$ is not significantly different from zero in 78.1% of the sample. It is significantly positive (negative) for 10.5% (11.4%) for the sample. This pattern is robust to both market cap and industrial sectors. One can therefore conclude that there is evidence that the announcement of the addition to the reduced margin, which is relatively good news as it indicates a better quality firm, has no impact on the value of the company. Most likely, because the IIROC uses pre-determined criteria to decide on the inclusion of new securities to the list of eligibility to trade at reduced margin, the market accounts for the news sooner than the actual announcement date. There is little surprise in this finding. The cross-section test tells a slightly different story. In fact, the weighted average mean and the median are both negative. The aggregate t-statistic at -3.00 shows that the weighted average mean is indeed significantly lower than zero. Even if the announcement is considered a positive event, the negative impact shows that the market actually accounted for that good news before the announcement and beyond which requires actually an adjustment to reduce the value of the company upon the announcement. However, the size of the adjustment is economically marginal. Over the three day announcement period return decreases on average by 15 basis points, which does not even cover the trading costs.

Panel B of table 5 reports the results relative to abnormal returns around the effective date i.e., the actual reduction in the margin requirement. Our prior expectation is that if markets are efficient, then no effect on valuation should be documented around the effective date as all valuation impact is dissipated around the announcement date. All findings from panel B confirm this hypothesis. Overall, 75.9% of the observations in the sample show no significant effect ($\lambda_{i,2}$ not significantly different from zero). Moreover, the cross-section test shows identical inference.

The main parameter of interest is ϕ_i which is related to the increase in the (natural logarithm) of the volatility post announcement. Again, most (85.6% of the sample) individual estimates are not significantly different from zero. This result is robust to the industrial sectors and the market capitalization or the size of the issuing companies. One can conclude as a result that when margin requirement is reduced from 50% to 30% in Canada, volatility remains constant post margin change. This conclusion is similar to that which we already have drawn from the variance ratios. There are, however, more negative ϕ_i estimates (58.2%) than positive estimates (41.8%) which lead to a negative significant median. Because dispersion is low, the cross-section t-test supports the fact that the volatility actually falls post-margin requirement decrease. This result is again consistent with the findings of the previous sub-section using variance ratio tests.

Table 6 reports abnormal volume changes around the actual trading at the lower required margin. $\beta_{i,1}$ should be interpreted as the jump in turnover caused by change in margin requirement. Individual results seem to indicate that turnover does not change in 67.7% of the observation in our addition sample. There are 27.9% of the cases where the turnover actually falls. For all industry sectors and sizes, the proportion of negative

effect on turnover is much higher than that of the positive effect. Both the cross-section and the median are negative with 64.4% of all cases showing negative impact. This result is counterintuitive as one expects trading volume to actually increase after allowing traders to trade at a lower margin requirement. The lower margin is an invitation to the extremely optimistic buyers (pessimistic sellers) to take more leveraged position (to short more shares given higher leverage power) and hence trade more. We do not directly address the liquidity issue in this thesis. However, liquidity could be at the centre of the counterintuitive result we report. Allowing the two extremes to trade may actually reduce liquidity and deter "regular" investors from entering the market who prefer to wait and see the outcome of the clash between buyers on margin and short sellers. Once a price direction is set, they may re-enter the market again.

B.2 Margin Increases (Deletions)

We now turn to the sub-sample that experienced an increase in the required margin from 30% to 50%. As for the addition group, we start by analyzing the impact of the announcement and the actual implementation of the new margin on the value of the underlying company (effect on returns), then the effect on the volatility from the E-GARCH equation. We finally investigate the effect of the announcement and implementation of the new margin on the trading activity by investigating the change in the turnover post increase in the margin.

Panel A of table 7 shows that the announcement has little effect on the value of the company upon announcement. In 83.2% of the cases $\lambda_{i,1}$ is not significantly different from zero. This result is robust to firm size or industry sector. Even more for utilities and

telecommunications, all individual estimates of $\lambda_{i,1}$ are not significant. For large firms that are followed by a large number of financial analysts and traders, 94.4% of the observations show no change in the value of the company post-announcement. One can state that the deletion was most likely predictable as the IIROC uses pre-determined criteria to set the list of firms that will trade at higher margin requirement. As this criterion is public knowledge and easily accessible long before the announcement, any effect of the change in the required margin itself should be accounted for well before the actual announcement as efficient markets theory would suggest.

A similar inference about the effect of increasing the margin requirement on the value of the underlying firm when the actual trading is at the new higher margin can be made. Panel B of table 7 shows that in 79.6% of the cases, no significant impact on the value of the underlying firm is achieved when margin increases from 30% to 50%. Again, this is not a surprising result. Most of the potential effect should be accounted for when the market assesses the likelihood of the margin increase. This occurs well before the announcement is made by the IIROC which takes place ten business days prior to the actual implementation of the new margin.

The parameter of interest to us is presented in panel C of table 7. As for the addition sample, ϕ_i is the increase in volatility post-announcement. It measures the change in the (natural logarithm) of the conditional volatility after the IIROC announces that margin requirement will increase from 30% to 50%. Similar to the addition case, most (83.9%) of individual estimates of ϕ_i show that increasing the margin requirement does not affect volatility as the parameters are not significantly different from zero. However, most results are negative (61.3% of the sample) which leads to a significantly

negative cross-section median of -0.052. The low dispersion and presence of highly negative values pushes the mean to be negative at -0.118 and the weighted average to be at -0.033 with highly negative and significant t-stats. The cross-section tests thus indicate that when margin requirement is increased in Canada from 30% to 50%, volatility falls. Can we as a result of these findings conclude that authorities can rely on increasing the margin requirements to reduce volatility when extreme volatility periods are dominant? This section does not provide a strong and clear positive answer. However, one can weakly state that. As table 8 reports, reduction in volatility is accompanied by a fall in the turnover, which indicates a relatively lower trading activity. As suggested by literature lower volatility is consistent with lower trading activity.

C. Robustness Analysis

To gain confidence in our empirical analysis, various robustness tests are run. First, we allow for exact identification of the announcement and effective dates in which case both the dummy variables $ANN_{i,t}$ and $EFF_{i,t}$ take the value one only during respectively the day of the announcement and the effective day or when margin change becomes effective and zero otherwise. We also use the global CFMRC index as a proxy for the market portfolio instead of the index containing securities with a minimum price per share of two dollars. As an alternative, we estimate the market model using 10 industry sector portfolios to capture the expected return with the following specification:

$$r_{i,t} = \alpha_i + \beta_{i,} r_{m,t} + \sum_{k=1}^{10} \delta_{i,k} r_{k,t} + \lambda_{i,1} ANN_{i,t} + \lambda_{i,2} EFF_{i,t} + \varepsilon_{i,t}$$

Where $r_{k,t}$ is the return on sector portfolio k for day t and remaining variable and parameters are as defined earlier.

To increase the rate of convergence, we also investigate a simple GARCH(1,1) specification instead of (4)-(5) where the conditional volatility equation is defined as

$$\sigma_{i,t}^2 = w_i + \varphi_i \sigma_{i,t-1}^2 + \theta_i \sigma_{i,t-1}^2 + \phi_i POSTANN_{i,t}$$

with all variables and parameters are as defined previously. To allow for leverage effect, we also estimated the Glosten, Jagannathan, and Runkle (1993) model using the following specification:

$$\sigma_{i,t}^2 = w_i + \varphi_i \sigma_{i,t-1}^2 + \theta_i \varepsilon_{i,t-1}^2 + \delta_i \left|\varepsilon_{i,t-1}\right| + \phi_i POSTANN_{i,t}$$

Our results show that all alternative specification do not alter our main conclusion with regard to the abnormal returns around both the announcement and the effective dates of margin requirement changes nor do they significantly change the inference about the change in the volatility as a result of the change in the margin.

VIII. Conclusion

The recent stock market crash of 2008 leads us to reexamine the influence of margin requirements on stock price variability. The increase of margin requirement can be used by regulators for the purpose of decreasing volatility and stabilizing the stock market. The effectiveness of this policy is highly controversial amongst academics as empirical tests of the link between margin requirement and volatility provide conflicting results.

Most research that was conducted using U.S. data investigated the effect of twenty-two changes in initial margin requirement that were mandated by the Fed over the period 1934-1974. Since then, margin requirement is kept constant at 50%. Therefore, no new evidence based on U.S. data can be achieved as no change in margin has occurred. Recognizing this fact, this thesis investigates the effectiveness of margin requirement policy in controlling market volatility by using more recent Canadian data.

Margin requirement in Canada is unique in that only stocks on the "List of Securities for Reduced Margin" can be traded at the margin rate of 30%, rather than at the regular rate of 50%. The IIROC, the margin regulatory authority in Canada, is responsible for revising and publishing this list every quarter. This list provides an ideal setting for us to test for the effect of a margin increase from 30% to 50% (decrease from 50% to 30%) on the volatility of each security.

With regard to margin increase from 30% to 50%, our empirical results show that the majority of observations do not experience changes in volatility and trading activity after margin increase. We can interpret these findings as not supporting the use of the margin requirement as a policy tool to stabilize the stock market during periods of high

volatility. This argument is also confirmed by the sample of securities that experiences decrease in the margin requirement from 50% to 30%.

This thesis also examines the return effect around both the announcement day and the effective day of margin change. Our empirical findings document that the change in margin requirement does not affect the value of the underlying company around either the announcement or the effective date in the cases of both margin increase and margin decrease.

Theoretically, if margin policy is an effective tool in controlling price variability, the higher margins would limit the pyramiding process, thus driving stock prices, trading activities, and volatilities lower. However, the findings of this thesis lead us to argue that the use of margin policy by regulators fails to achieve its goal of inhibiting speculating activities and stabilizing volatility.

This thesis provides useful insight for regulators, especially for those who actively change margin requirements in their countries, with respect to setting margin regulation. Our research has examined whether margin changes can be used to reduce fluctuations in the stock market. The empirical findings of this thesis, however, should not lead one to believe that margin requirements should be abolished as it is used for other purposes including hedging against default risk by counterparties. Further research is required to examine whether margin requirement is effective in accomplishing these other margin policy objectives.

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Table 1: Addition/Deletion Distribution over time

This table reports the distribution of additions and deletions of our sample dated from June 30, 2000 through July 5, 2007. Column 1 reports the announcement date of the release of the new list. Column 2 reports the effective date of margin change for securities listed on the new list. The interval between the announcement date and effective date is ten business days. Column 3-4 (5-6) reports the sample of additions (deletions).

Panel A: Original Sample

Announcement Date	Effective Date	Additions	Yearly Total	Deletions	Yearly Total
24-Aug-00	8-Sep-00	240		66	
7-Dec-00	21-Dec-00	70	310	70	136
12-Mar-01	26-Mar-01	54		91	
7-May-01	22-May-01	89		40	
15-Aug-01	29-Aug-01	88		97	
12-Nov-01	26-Nov-01	63	294	136	364
15-Feb-02	1-Mar-02	106		41	
29-May-02	12-Jun-02	98		63	
19-Aug-02	3-Sep-02	76		85	
12-Nov-02	26-Nov-02	51	331	95	284
14-Feb-03	28-Feb-03	79		58	
9-May-03	26-May-03	72		72	
18-Aug-03	2-Sep-03	86		50	
21-Nov-03	4-Dec-03	94	331	32	212
25-Feb-04	9-Mar-04	69		35	
27-May-04	9-Jun-04	135		43	
26-Aug-04	10-Sep-04	75		106	
6-Dec-04	20-Dec-04	112	391	138	322
8-Mar-05	22-Mar-05	168		70	
28-Jun-05	13-Jul-05	107		67	
18-Aug-05	1-Sep-05	103		108	
21-Nov-05	5-Dec-05	129	507	75	320
1-Mar-06	15-Mar-06	107		83	
6-Jul-06	20-Jul-06	108		72	
18-Oct-06	1-Nov-06	76	291	120	275
11-Jan-07	23-Jan-07	74		121	
20-Apr-07	4-May-07	132		79	
20-Jun-07	5-Jul-07	95		105	
29-Aug-07	13-Sep-07	92		93	
10-Dec-07	27-Dec-07	55	448	138	536
8-Feb-08	26-Feb-08	96		102	
27-May-08	11-Jun-08	73		130	
18-Aug-08	29-Aug-08	96		84	
4-Nov-08	26-Nov-08	48	313	247	563
Cumulated:		**3216**		**3012**	

Panel B: Final Sample

Announcement Date	Effective Date	Additions	Yearly Total	Deletions	Yearly Total
24-Aug-00	8-Sep-00	58		16	
7-Dec-00	21-Dec-00	8	66	3	19
12-Mar-01	26-Mar-01	13		6	
7-May-01	22-May-01	13		2	
15-Aug-01	29-Aug-01	15		5	
12-Nov-01	26-Nov-01	5	46	12	25
15-Feb-02	1-Mar-02	20		1	
29-May-02	12-Jun-02	19		3	
19-Aug-02	3-Sep-02	10		3	
12-Nov-02	26-Nov-02	9	58	13	20
14-Feb-03	28-Feb-03	13		5	
9-May-03	26-May-03	23		7	
18-Aug-03	2-Sep-03	39		4	
21-Nov-03	4-Dec-03	40	115	2	18
25-Feb-04	9-Mar-04	30		1	
27-May-04	9-Jun-04	31		8	
26-Aug-04	10-Sep-04	25		11	
6-Dec-04	20-Dec-04	13	99	9	29
8-Mar-05	22-Mar-05	29		1	
28-Jun-05	13-Jul-05	35		5	
18-Aug-05	1-Sep-05	41		6	
21-Nov-05	5-Dec-05	41	146	5	17
1-Mar-06	15-Mar-06	47		6	
6-Jul-06	20-Jul-06	36		5	
18-Oct-06	1-Nov-06	19	102	8	19
11-Jan-07	23-Jan-07	28		10	
20-Apr-07	4-May-07	29		2	
20-Jun-07	5-Jul-07	21	78	6	18
Cumulated:		**710**		**165**	

Table 2: Descriptive Statistics

This table reports the descriptive statistics for share price, return, Beta, Transactions, Trading volume, Shares Outstanding, Market Capitalization, Total Assets and Leverage. All the market information is obtained from CFMRC database. Share price, Return, Beta, Transactions, Trading volume, Shares Outstanding, and Market Capitalization is the average of their individual seven-month data during the pre-effective window. Financial Statement information is primary obtained from Compustat. System for Electronic Document Analysis and Retrieval (SEDAR) filing system was used to cover information that was unable to be retrieved from Compustat. Leverage is calculated as total assets divided by total liabilities. Total assets and total liabilities are collected from the most recent annual financial statement released before the announcement date.

Panel A: Overall 2001 - 2007

	Share Price			Shares Outstanding (thousands)			Market Capitalization (millions $)		
Statistics	All	Addition	Deletion	All	Addition	Deletion	All	Addition	Deletion
Median	6.66	6.87	6.22	30560.70	30757.27	28001.80	179.69	182.37	161.37
Mean	10.13	9.83	11.43	49543.09	49207.87	50985.53	529.20	546.90	453.01
Min	1.58	1.70	1.58	1245.90	4117.31	1245.90	36.50	47.48	36.50
Max	107.24	107.24	93.37	1298809.80	1298809.80	1030407.13	81830.75	81830.75	16261.54
SD	11.72	10.92	14.66	84361.85	82215.00	93294.00	3022.19	3277.85	1489.65

	Return			Transactions			Total Assets (millions $)		
Statistics	All	Addition	Deletion	All	Addition	Deletion	All	Addition	Deletion
Median	0.0218	0.0321	(0.0183)	772.29	811.21	493.86	136.7865	132.4090	151.6487
Mean	0.0277	0.0398	(0.0247)	2287.46	2226.06	2551.67	925.7175	784.6090	1175.7963
Min	(0.2488)	(0.1175)	(0.2488)	85.71	85.71	105.29	0.1322	0.1322	6.9961
Max	0.3260	0.3260	0.2246	87051.71	71363.71	87051.71	119024.0863	119024.0863	27752.6000
SD	0.0614	0.0546	0.0619	6059.39	5542.80	7922.41	5340.8126	5264.6052	3867.0083

	Beta			Trading volume (thousands)			Leverage		
Statistics	All	Addition	Deletion	All	Addition	Deletion	All	Addition	Deletion
Median	0.7773	0.7743	0.8246	1352.77	1442.39	643.41	2.79	2.80	3.14
Mean	1.0013	1.0126	0.9736	3979.69	3978.41	3985.18	14.04	12.89	17.48
Min	(1.9339)	(1.9339)	(0.4007)	15.33	15.33	45.71	0.28	0.28	1.03
Max	4.7934	4.7934	3.5209	193483.21	193483.21	140579.40	1154.77	1154.77	1079.63
SD	0.9090	0.9487	0.8060	12268.96	12161.28	12760.04	66.63	55.85	92.31

Panel B: From 2000 to 2007

Share Price

	Median			Mean		
Year	All	Addition	Deletion	All	Addition	Deletion
2000	7.21	5.61	18.36	15.81	13.91	22.42
2001	7.82	7.85	7.51	12.51	11.41	14.54
2002	9.25	9.88	8.08	12.83	12.33	14.27
2003	5.77	5.27	8.04	7.53	7.05	10.59
2004	5.73	6.84	4.49	9.38	9.84	7.79
2005	7.66	8.95	3.22	10.08	10.26	8.49
2006	6.20	6.18	6.29	8.03	8.11	7.58
2007	7.24	7.97	2.65	8.48	9.08	5.88

Share Outstanding (thousands)

	Median			Mean		
Year	All	Addition	Deletion	All	Addition	Deletion
2000	31332.11	34116.69	16790.66	52131.08	58967.52	28383.44
2001	28101.17	28081.79	31026.30	42746.56	46808.17	35273.20
2002	26276.75	26276.75	25783.96	57078.43	41538.74	102143.55
2003	29323.99	29628.21	26123.63	55508.73	56877.76	46762.20
2004	28784.87	28233.10	40491.71	39149.03	37213.47	45756.66
2005	30112.00	29027.05	38806.40	41265.33	40327.37	49320.78
2006	30896.96	31133.76	21769.90	50815.22	52366.67	42486.34
2007	42724.35	42724.35	42175.30	64201.11	64474.85	63014.93

Return

	Median			Mean		
Year	All	Addition	Deletion	All	Addition	Deletion
2000	0.0181	0.0259	0.0022	0.0203	0.0299	(0.0131)
2001	0.0097	0.0261	(0.0234)	0.0052	0.0292	(0.0390)
2002	0.0220	0.0425	(0.0510)	0.0221	0.0476	(0.0518)
2003	0.0403	0.0475	(0.0014)	0.0476	0.0575	(0.0161)
2004	0.0201	0.0237	(0.0157)	0.0207	0.0349	(0.0278)
2005	0.0285	0.0314	(0.0095)	0.0349	0.0387	0.0019
2006	0.0186	0.0212	(0.0084)	0.0278	0.0328	0.0006
2007	0.0125	0.0313	(0.0319)	0.0247	0.0403	(0.0426)

Transactions

	Median			Mean		
Year	All	Addition	Deletion	All	Addition	Deletion
2000	456.86	495.50	377.43	2103.85	2090.51	2150.17
2001	544.00	531.17	597.14	1553.09	1257.00	2097.89
2002	699.43	739.36	520.57	3065.66	1987.61	6192.03
2003	729.71	754.00	412.13	2369.07	2368.65	2371.71
2004	872.21	910.43	701.57	1987.71	1914.47	2237.74
2005	812.43	825.43	769.00	1680.92	1718.71	1356.37
2006	817.14	882.36	317.86	2215.58	2421.39	1110.69
2007	1196.07	1461.86	673.57	3767.92	3969.02	2896.49

Beta

	Median			Mean		
Year	All	Addition	Deletion	All	Addition	Deletion
2000	0.7809	0.7844	0.7000	0.8044	0.8178	0.7627
2001	0.6589	0.5708	0.9049	0.8020	0.6414	0.9947
2002	0.7273	0.5584	1.0546	0.8622	0.7315	1.1456
2003	0.8901	0.9332	0.4424	0.9876	1.0625	0.6409
2004	0.6679	0.8806	0.3644	1.0769	1.2219	0.7810
2005	0.7144	0.6954	1.2837	1.0754	1.0381	1.2122
2006	1.0748	1.2874	0.7419	1.3908	1.4861	1.1763
2007	0.8449	0.7526	0.8449	1.0745	0.9941	1.1924

Trading Volume (thousands)

	Median			Mean		
Year	All	Addition	Deletion	All	Addition	Deletion
2000	714.50	1000.22	457.84	2007.42	2136.61	1558.66
2001	950.00	972.58	883.35	2186.26	1930.29	2657.24
2002	972.38	1068.36	645.66	4975.95	3370.13	9632.83
2003	1345.70	1361.66	442.30	5560.60	5748.29	4361.46
2004	1743.41	1731.40	1755.41	3092.55	2723.21	4353.38
2005	1440.61	1465.37	748.17	3123.23	3171.42	2709.39
2006	1627.59	1759.67	452.66	3720.61	4125.69	1545.97
2007	1801.34	1881.02	1784.41	7016.27	7498.68	4925.82

(Panel B-Contiuned)

Panel B: From 2000 to 2007

	Total Assets (millions $)					
	Median			Mean		
Year	All	Addition	Deletion	All	Addition	Deletion
2000	252.11	249.14	374.12	2808.58	3252.49	1085.14
2001	214.54	197.87	319.75	1538.61	778.32	2960.02
2002	198.34	192.13	238.18	1642.94	1039.10	3422.69
2003	121.12	121.12	327.09	587.02	587.02	1010.82
2004	102.29	102.29	95.09	451.27	451.27	191.17
2005	121.42	121.42	62.81	519.17	519.17	270.65
2006	110.49	110.49	126.34	172.73	172.73	184.95
2007	144.00	144.00	144.14	445.84	445.84	208.18

	Market Capitalization (millions $)					
	Median			Mean		
Year	All	Addition	Deletion	All	Addition	Deletion
2000	219.35	196.09	246.69	1541.89	1807.17	620.40
2001	159.84	163.86	159.84	660.24	816.05	373.55
2002	189.04	188.27	212.26	864.12	640.97	1511.25
2003	160.35	160.31	177.04	324.00	311.72	402.47
2004	162.66	174.66	151.85	359.99	403.75	210.61
2005	167.89	172.90	110.49	323.53	342.08	164.23
2006	177.14	190.10	145.11	306.23	331.97	168.06
2007	242.61	258.25	116.30	403.61	444.72	225.44

	Leverage					
	Median			Mean		
Year	All	Addition	Deletion	All	Addition	Deletion
2000	2.10	2.10	2.08	5.88	3.59	14.81
2001	1.85	1.83	2.14	21.65	31.23	3.75
2002	2.69	2.51	3.68	22.58	7.38	67.36
2003	2.44	2.44	2.82	11.43	11.43	4.57
2004	2.91	2.91	3.70	9.65	9.65	8.14
2005	3.14	3.14	3.77	12.14	12.14	11.87
2006	4.78	4.78	2.60	22.02	22.02	7.03
2007	3.03	3.03	2.93	10.53	10.53	29.88

Panel C: Two Sample t-test (Overall 2001-2007)

	Price	Return	Beta	Trans action	Volume	Share	Market Cap	Asset	Leverage
T-stat	1.583	-13.334	-0.437	0.622	0.006	0.244	-0.359	0.883	0.811
P-value	0.114	0.000	0.662	0.534	0.995	0.808	0.720	0.377	0.418
Wilcoxon	1.206	12.335	0.002	3.706	5.022	1.144	1.579	1.789	0.704
P-value	0.228	0.000	0.998	0.000	0.000	0.253	0.114	0.074	0.482

Table 3: Summary Results for Variance Ratio Tests: Margin Decreases

This table summarizes the results of F-tests (in Panel A) and the modified Levene tests (in Panel C) for stocks listed under Additions from the List of Securities Eligible for Reduced Margin (the list). Panel B reports the cross-sectional statistics of all F-ratios. The stock sample covers the period June 30, 2000 to July 5, 2007. This sample includes 710 observations. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The F-ratio is constructed as the ratio of the pre-announcement variance to the post-announcement variance. The F-ratio and the modified Levene statistic are tested for statistical significance at 5% level by comparison with appropriate F critical value. Panel A and Panel B categorize the observations by the significance of the tested result and reports the number and the percentage of observations for each category.

Panel A: F-Test			**Panel B: Cross-Sectional Tests of F-Test**		**Panel C: Modified Levene**		
	Significant					Significant	
	#	%				#	%
Variance Ratio > 1	222	31.27			Pre-Change Variance > Post-Change Variance	128	18.03
			T-statistic	7.34			
			P-value	0.00			
Variance Ratio < 1	171	24.08			Post-Change Variance > Pre-Change Variance	95	13.38
Total	393	55.35	Wilcoxon z-statistic	5.83	Total	223	31.41
			P-value	0.00			
	Insignificant					Insignificant	
	#	%				#	%
Total	317	44.65	Median	1.06	Total	487	68.59
			Mean	1.26			
	All		Min	0.10		All	
	#	%	Max	10.93		#	%
Total	710	100.00	Standard Deviation	0.96	Total	710	100.00

Table 4: Summary Results for Variance Ratio Tests: Margin Increases

This table summarizes the results of F-tests (in Panel A) and the modified Levene tests (in Panel C) for stocks listed under Deletions from the List of Securities Eligible for Reduced Margin (the list). Panel B reports the cross-sectional statistics of all F-ratios. The stock sample covers the period June 30, 2000 to July 5, 2007. This sample includes 165 observations. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The F-ratio is constructed as the ratio of the pre-announcement variance to the post-announcement variance. The F-ratio and the modified Levene statistic are tested for statistical significance at 5% level by comparison with appropriate F critical value. Panel A and Panel B categorize the observations by the significance of the tested result and reports the number and the percentage of observations for each category.

Panel A: F-Test

	Significant	
	#	%
Variance Ratio > 1	75	45.45
Variance Ratio < 1	34	20.61
Total	109	66.06
	Insignificant	
	#	%
Total	56	33.94
	All	
	#	%
Total	165	100.00

Panel B: Cross-Sectional Tests of F-Test

T-statistic	5.64
P-value	0.00
Wilcoxon z-statistic	6.13
P-value	0.00
Median	1.37
Mean	1.58
Min	0.18
Max	12.98
Standard Deviation	1.32

Panel C: Modified Levene

	Significant	
	#	%
Pre-Change Variance > Post-Change Variance	46	27.88
Post-Change Variance > Pre-Change Variance	15	9.09
Total	61	36.97
	Insignificant	
	#	%
Total	104	63.03
	All	
	#	%
Total	165	100.00

Table 5: Cross-sectional Results of Daily Return Market Model for Additions

We estimate the following E-GARCH model

$$r_{i,t} = \alpha_i + \beta_{i,} r_{m,t} + \lambda_{i,1} ANN_{i,t} + \lambda_{i,2} EFF_{i,t} + \varepsilon_{i,t},$$

$$\ln(\sigma_{i,t}^2) = w_i + \varphi_i \ln(\sigma_{i,t-1}^2) + \theta_i \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} + \delta_i \left|\frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}}\right| + \phi_i POSTANN_{i,t}$$

This table summarize the results for $\lambda_{i,1}$, $\lambda_{i,2}$ and ϕ_i from the above estimated time series model for stocks listed under Additions from the List of Securities Eligible for Reduced Margin (the list). The stock sample covers the period June 30, 2000 to July 5, 2007. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The definitions of the variables in the model are as follows: $r_{i,t}$ is the return on observation i during day t. $r_{m,t}$ is the return during day t on the CFMRC Index for securities with per share price above \$2. $\varepsilon_{i,t}$ is the zero-mean disturbance. $\sigma_{i,t}^2$ is the conditional variance of the return of firm i at time t. $ANN_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change announcement date and zero elsewhere. $EFF_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change effective date and zero elsewhere. $POSTANN_{i,t}$ take the value 1 starting one day before the margin change announcement date and onward and zero elsewhere. The first part of each panel categorized the estimated coefficients by the sign and significance and reports the number of the estimated coefficients in each category and the respective percentage within a given industry sector. The significance of the estimated coefficients is determined by t-statistic at 5% significance level. The second part of each panel is reported in the same format as the first part. The third part of each panel reports the cross-sectional statistics. The aggregate t-statistics is computed as follow: $\sum w_i \hat{\gamma}_i / \sqrt{\sum w_i^2 var(\hat{\gamma}_i)}$,where $w_i = [var(\hat{\gamma}_i)]^{-1} / \sum [var(\hat{\gamma}_i)]^{-1}$ and $var(\hat{\gamma}_i)$ is the square of the standard error of the estimated parameter in the time series regression. Weighted Average is refer to $\sum w_i \hat{\gamma}_i$.

Panel A: $\lambda_{i,1}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	14	7.7	24	13.2	38	20.9	63	34.6	81	44.5	144	79.1	77	42.3	105	57.7	182	28.1
Materials	22	15.1	20	13.7	42	28.8	46	31.5	58	39.7	104	71.2	68	46.6	78	53.4	146	22.5
Industrials	10	13.9	6	8.3	16	22.2	26	36.1	30	41.7	56	77.8	36	50.0	36	50.0	72	11.1
Consumer Discretionary	3	5.5	4	7.3	7	12.7	18	32.7	30	54.5	48	87.3	21	38.2	34	61.8	55	8.5
Consumer Staples	2	11.8	5	29.4	7	41.2	4	23.5	6	35.3	10	58.8	6	35.3	11	64.7	17	2.6
Health Care	4	10.0	4	10.0	8	20.0	11	27.5	21	52.5	32	80.0	15	37.5	25	62.5	40	6.2
Financials	5	8.1	5	8.1	10	16.1	31	50.0	21	33.9	52	83.9	36	58.1	26	41.9	62	9.6
Information Technology	5	10.6	4	8.5	9	19.1	18	38.3	20	42.6	38	80.9	23	48.9	24	51.1	47	7.3
Telecommunication Services	0	0.0	2	22.2	2	22.2	2	22.2	5	55.6	7	77.8	2	22.2	7	77.8	9	1.4
Utilities	3	16.7	0	0.0	3	16.7	9	50.0	6	33.3	15	83.3	12	66.7	6	33.3	18	2.8
Total	**68**	**10.5**	**74**	**11.4**	**142**	**21.9**	**228**	**35.2**	**278**	**42.9**	**506**	**78.1**	**296**	**45.7**	**352**	**54.3**	**648**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	22	10.0	23	10.5	45	20.5	79	36.1	95	43.4	174	79.5	101	46.1	118	53.9	219	33.8
Between $140 million & $280 million	25	11.0	23	10.1	48	21.1	79	34.8	100	44.1	179	78.9	104	45.8	123	54.2	227	35.0
Less than $140 million	21	10.4	28	13.9	49	24.3	70	34.7	83	41.1	153	75.7	91	45.0	111	55.0	202	31.2
Total	**68**	**10.5**	**74**	**11.4**	**142**	**21.9**	**228**	**35.2**	**278**	**42.9**	**506**	**78.1**	**296**	**45.7**	**352**	**54.3**	**648**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00064
Median	-0.00119
Standard Deviation	0.01708
Weighted Average	-0.00053
Aggregate T-statistics	-2.99678

Panel B: $\lambda_{i,2}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	27	14.8	13	7.1	40	22.0	65	35.7	77	42.3	142	78.0	92	50.5	90	49.5	182	28.1
Materials	14	9.6	22	15.1	36	24.7	52	35.6	58	39.7	110	75.3	66	45.2	80	54.8	146	22.5
Industrials	7	9.7	10	13.9	17	23.6	17	23.6	38	52.8	55	76.4	24	33.3	48	66.7	72	11.1
Consumer Discretionary	3	5.5	6	10.9	9	16.4	29	52.7	17	30.9	46	83.6	32	58.2	23	41.8	55	8.5
Consumer Staples	4	23.5	3	17.6	7	41.2	5	29.4	5	29.4	10	58.8	9	52.9	8	47.1	17	2.6
Health Care	5	12.5	2	5.0	7	17.5	15	37.5	18	45.0	33	82.5	20	50.0	20	50.0	40	6.2
Financials	11	17.7	5	8.1	16	25.8	25	40.3	21	33.9	46	74.2	36	58.1	26	41.9	62	9.6
Information Technology	7	14.9	11	23.4	18	38.3	15	31.9	14	29.8	29	61.7	22	46.8	25	53.2	47	7.3
Telecommunication Services	1	11.1	0	0.0	1	11.1	6	66.7	2	22.2	8	88.9	7	77.8	2	22.2	9	1.4
Utilities	3	16.7	2	11.1	5	27.8	8	44.4	5	27.8	13	72.2	11	61.1	7	38.9	18	2.8
Total	**82**	**12.7**	**74**	**11.4**	**156**	**24.1**	**237**	**36.6**	**255**	**39.4**	**492**	**75.9**	**319**	**49.2**	**329**	**50.8**	**648**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	29	13.2	30	13.7	59	26.9	86	39.3	74	33.8	160	73.1	115	52.5	104	47.5	219	33.8
Between $140 million & $280 million	28	12.3	29	12.8	57	25.1	81	35.7	89	39.2	170	74.9	109	48.0	118	52.0	227	35.0
Less than $140 million	25	12.4	15	7.4	40	19.8	70	34.7	92	45.5	162	80.2	95	47.0	107	53.0	202	31.2
Total	**82**	**12.7**	**74**	**11.4**	**156**	**24.1**	**237**	**36.6**	**255**	**39.4**	**492**	**75.9**	**319**	**49.2**	**329**	**50.8**	**648**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00148
Median	-0.00017
Standard Deviation	0.01744
Weighted Average	0.00030
Aggregate T-statistics	1.70998

Panel C: ϕ_i

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	14	7.7	14	7.7	28	15.4	67	36.8	87	47.8	154	84.6	81	44.5	101	55.5	182	28.1
Materials	8	5.5	15	10.3	23	15.8	43	29.5	80	54.8	123	84.2	51	34.9	95	65.1	146	22.5
Industrials	6	8.3	5	6.9	11	15.3	29	40.3	32	44.4	61	84.7	35	48.6	37	51.4	72	11.1
Consumer Discretionary	4	7.3	4	7.3	8	14.5	24	43.6	23	41.8	47	85.5	28	50.9	27	49.1	55	8.5
Consumer Staples	0	0.0	0	0.0	0	0.0	7	41.2	10	58.8	17	100.0	7	41.2	10	58.8	17	2.6
Health Care	1	2.5	4	10.0	5	12.5	11	27.5	24	60.0	35	87.5	12	30.0	28	70.0	40	6.2
Financials	3	4.8	4	6.5	7	11.3	25	40.3	30	48.4	55	88.7	28	45.2	34	54.8	62	9.6
Information Technology	1	2.1	5	10.6	6	12.8	16	34.0	25	53.2	41	87.2	17	36.2	30	63.8	47	7.3
Telecommunication Services	0	0.0	2	22.2	2	22.2	2	22.2	5	55.6	7	77.8	2	22.2	7	77.8	9	1.4
Utilities	1	5.6	2	11.1	3	16.7	9	50.0	6	33.3	15	83.3	10	55.6	8	44.4	18	2.8
Total	**38**	**5.9**	**55**	**8.5**	**93**	**14.4**	**233**	**36.0**	**322**	**49.7**	**555**	**85.6**	**271**	**41.8**	**377**	**58.2**	**648**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	14	6.4	23	10.5	37	16.9	69	31.5	113	51.6	182	83.1	83	37.9	136	62.1	219	33.8
Between $140 million & $280 million	16	7.0	14	6.2	30	13.2	96	42.3	101	44.5	197	86.8	112	49.3	115	50.7	227	35.0
Less than $140 million	8	4.0	18	8.9	26	12.9	68	33.7	108	53.5	176	87.1	76	37.6	126	62.4	202	31.2
Total	**38**	**5.9**	**55**	**8.5**	**93**	**14.4**	**233**	**36.0**	**322**	**49.7**	**555**	**85.6**	**271**	**41.8**	**377**	**58.2**	**648**	**100.0**

Cross-Sectional Statistics	**All**
Average	-0.09041
Median	-0.03089
Standard Deviation	0.46603
Weighted Average	-0.00303
Aggregate T-statistics	-2.44921

Table 6: Cross-sectional Results of Daily Volume Market Model for Additions

The estimated model is

$$Volturnover_{i,t} = \alpha_i + \beta_{i,0} Volturnover_{m,t} + \beta_{i,1} D1_{i,t} + \varepsilon_{i,t}$$

This table summarize the results for $\beta_{i,1}$ from the above estimated time series model for stocks listed under Additions from the List of Securities Eligible for Reduced Margin (the list). The stock sample covers the period June 30, 2000 to July 5, 2007. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The definitions of the variables in the model are as follows: $Volturnover_{i,t}$ is the volume on observation i during day t divided by the outstanding shares of the respective month. $Volturnover_{m,t}$ is the equal-weighted volume turnover of all domestic common equalities on TSX during day t. $D1_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and five days after the effective date and zero elsewhere. $\varepsilon_{i,t}$ is the residual with zero-mean disturbance and unconditional variance. This table categorized the estimated coefficients by the sign and significance and reports the number of the estimated coefficients in each category and the respective percentage within a given industry sector. The significance of the estimated coefficients is determined by t-statistic at 5% significance level. The second part of this table is reported in the same format as the first part. The third part of this table reports the cross-sectional statistics. The aggregate t-statistics is computed as follow: $\sum w_i \hat{\gamma}_i / \sqrt{\sum w_i^2 var(\hat{\gamma}_i)}$,where $w_i = [var(\hat{\gamma}_i)]^{-1} / \sum [var(\hat{\gamma}_i)]^{-1}$ and $var(\hat{\gamma}_i)$ is the square of the standard error of the estimated parameter in the time series regression. Weighted Average is refer to $\sum w_i \hat{\gamma}_i$.

$\beta_{i,1}$

Industry	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	6	3.0	46	23.4	52	26.4	58	29.4	87	44.2	145	73.6	64	32.5	133	67.5	197	27.7
Materials	10	6.2	51	31.5	61	37.7	53	32.7	48	29.6	101	62.3	63	38.9	99	61.1	162	22.8
Industrials	4	5.1	24	30.4	28	35.4	22	27.8	29	36.7	51	64.6	26	32.9	53	67.1	79	11.1
Consumer Discretionary	2	3.2	21	33.9	23	37.1	17	27.4	22	35.5	39	62.9	19	30.6	43	69.4	62	8.7
Consumer Staples	0	0.0	3	14.3	3	14.3	11	52.4	7	33.3	18	85.7	11	52.4	10	47.6	21	3.0
Health Care	2	4.7	14	32.6	16	37.2	16	37.2	11	25.6	27	62.8	18	41.9	25	58.1	43	6.1
Financials	3	4.6	13	20.0	16	24.6	23	35.4	26	40.0	49	75.4	26	40.0	39	60.0	65	9.2
Information Technology	2	3.8	17	32.7	19	36.5	14	26.9	19	36.5	33	63.5	16	30.8	36	69.2	52	7.3
Telecommunication Services	0	0.0	4	44.4	4	44.4	1	11.1	4	44.4	5	55.6	1	11.1	8	88.9	9	1.3
Utilities	2	10.0	5	25.0	7	35.0	7	35.0	6	30.0	13	65.0	9	45.0	11	55.0	20	2.8
Total	**31**	**4.4**	**198**	**27.9**	**229**	**32.3**	**222**	**31.3**	**259**	**36.5**	**481**	**67.7**	**253**	**35.6**	**457**	**64.4**	**710**	**100.0**

Market Capitalization	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	13	5.3	64	26.3	77	31.7	69	28.4	97	39.9	166	68.3	82	33.7	161	66.3	243	34.2
Between $140 million & $280 million	12	4.8	74	29.7	86	34.5	83	33.3	80	32.1	163	65.5	95	38.2	154	61.8	249	35.1
Less than $140 million	6	2.8	60	27.5	66	30.3	70	32.1	82	37.6	152	69.7	76	34.9	142	65.1	218	30.7
Total	**31**	**4.4**	**198**	**27.9**	**229**	**32.3**	**222**	**31.3**	**259**	**36.5**	**481**	**67.7**	**253**	**35.6**	**457**	**64.4**	**710**	**100.0**

Cross-Sectional Statistics	All
Average	-0.01536
Median	-0.04354
Standard Deviation	0.27811
Weighted Average	0.00009
Aggregate T-statistics	2.63520

Table 7: Cross-sectional Results of Daily Return Market Model for Deletions

The estimated model is

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \lambda_{i,1} ANN_{i,t} + \lambda_{i,2} EFF_{i,t} + \varepsilon_{i,t},$$

$$\ln(\sigma_{i,t}^2) = w_i + \varphi_i \ln(\sigma_{i,t-1}^2) + \theta_i \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} + \delta_i \left| \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} \right| + \phi_i POSTANN_{i,t}$$

This table summarize the results for $\lambda_{i,1}$, $\lambda_{i,2}$ and ϕ_i from the above estimated time series model for stocks listed under Deletions from the List of Securities Eligible for Reduced Margin (the list). The stock sample covers the period June 30, 2000 to July 5, 2007. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The definitions of the variables in the model are as follows: $r_{i,t}$ is the return on observation i during day t. $r_{m,t}$ is the return during day t on the CFMRC Index for securities with per share price above \$2. $\varepsilon_{i,t}$ is the zero-mean disturbance. $\sigma_{i,t}^2$ is the conditional variance of the return of firm i at time t. $ANN_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change announcement date and zero elsewhere. $EFF_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change effective date and zero elsewhere. $POSTANN_{i,t}$ take the value 1 starting one day before the margin change announcement date and onward and zero elsewhere. The first part of each panel categorized the estimated coefficients by the sign and significance and reports the number of the estimated coefficients in each category and the respective percentage within a given industry sector. The significance of the estimated coefficients is determined by t-statistic at 5% significance level. The second part of each panel is reported in the same format as the first part. The third part of each panel reports the cross-sectional statistics. The aggregate t-statistics is computed as follow: $\sum w_i \hat{\gamma}_i / \sqrt{\sum w_i^2 var(\hat{\gamma}_i)}$,where $w_i = [var(\hat{\gamma}_i)]^{-1} / \sum [var(\hat{\gamma}_i)]^{-1}$ and $var(\hat{\gamma}_i)$ is the square of the standard error of the estimated parameter in the time series regression. Weighted Average is refer to $\sum w_i \hat{\gamma}_i$.

Panel A: $\lambda_{i,1}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	1	4.5	3	13.6	4	18.2	11	50.0	7	31.8	18	81.8	12	54.5	10	45.5	22	16.1
Materials	2	8.7	2	8.7	4	17.4	10	43.5	9	39.1	19	82.6	12	52.2	11	47.8	23	16.8
Industrials	1	6.7	1	6.7	2	13.3	7	46.7	6	40.0	13	86.7	8	53.3	7	46.7	15	10.9
Consumer Discretionary	0	0.0	3	17.6	3	17.6	5	29.4	9	52.9	14	82.4	5	29.4	12	70.6	17	12.4
Consumer Staples	0	0.0	1	14.3	1	14.3	5	71.4	1	14.3	6	85.7	5	71.4	2	28.6	7	5.1
Health Care	2	12.5	3	18.8	5	31.3	7	43.8	4	25.0	11	68.8	9	56.3	7	43.8	16	11.7
Financials	2	11.8	1	5.9	3	17.6	7	41.2	7	41.2	14	82.4	9	52.9	8	47.1	17	12.4
Information Technology	1	7.1	0	0.0	1	7.1	6	42.9	7	50.0	13	92.9	7	50.0	7	50.0	14	10.2
Telecommunication Services	0	0.0	0	0.0	0	0.0	1	33.3	2	66.7	3	100.0	1	33.3	2	66.7	3	2.2
Utilities	0	0.0	0	0.0	0	0.0	2	66.7	1	33.3	3	100.0	2	66.7	1	33.3	3	2.2
Total	**9**	**6.6**	**14**	**10.2**	**23**	**16.8**	**61**	**44.5**	**53**	**38.7**	**114**	**83.2**	**70**	**51.1**	**67**	**48.9**	**137**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	0	0.0	2	5.6	2	5.6	20	55.6	14	38.9	34	94.4	20	55.6	16	44.4	36	26.3
Between $140 million & $280 million	6	14.6	3	7.3	9	22.0	20	48.8	12	29.3	32	78.0	26	63.4	15	36.6	41	29.9
Less than $140 million	3	5.0	9	15.0	12	20.0	21	35.0	27	45.0	48	80.0	24	40.0	36	60.0	60	43.8
Total	**9**	**6.6**	**14**	**10.2**	**23**	**16.8**	**61**	**44.5**	**53**	**38.7**	**114**	**83.2**	**70**	**51.1**	**67**	**48.9**	**137**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00061
Median	0.00024
Standard Deviation	0.02552
Weighted Average	-0.00133
Aggregate T-statistics	-3.31304

Panel B: $\lambda_{i,2}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	2	9.1	2	9.1	4	18.2	10	45.5	8	36.4	18	81.8	12	54.5	10	45.5	22	16.1
Materials	3	13.0	1	4.3	4	17.4	10	43.5	9	39.1	19	82.6	13	56.5	10	43.5	23	16.8
Industrials	1	6.7	1	6.7	2	13.3	9	60.0	4	26.7	13	86.7	10	66.7	5	33.3	15	10.9
Consumer Discretionary	2	11.8	3	17.6	5	29.4	3	17.6	9	52.9	12	70.6	5	29.4	12	70.6	17	12.4
Consumer Staples	0	0.0	0	0.0	0	0.0	5	71.4	2	28.6	7	100.0	5	71.4	2	28.6	7	5.1
Health Care	3	18.8	3	18.8	6	37.5	6	37.5	4	25.0	10	62.5	9	56.3	7	43.8	16	11.7
Financials	1	5.9	1	5.9	2	11.8	5	29.4	10	58.8	15	88.2	6	35.3	11	64.7	17	12.4
Information Technology	3	21.4	2	14.3	5	35.7	5	35.7	4	28.6	9	64.3	8	57.1	6	42.9	14	10.2
Telecommunication Services	0	0.0	0	0.0	0	0.0	3	100.0	0	0.0	3	100.0	3	100.0	0	0.0	3	2.2
Utilities	0	0.0	0	0.0	0	0.0	1	33.3	2	66.7	3	100.0	1	33.3	2	66.7	3	2.2
Total	**15**	**10.9**	**13**	**9.5**	**28**	**20.4**	**57**	**41.6**	**52**	**38.0**	**109**	**79.6**	**72**	**52.6**	**65**	**47.4**	**137**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	3	8.3	2	5.6	5	13.9	14	38.9	17	47.2	31	86.1	17	47.2	19	52.8	36	26.3
Between $140 million & $280 million	6	14.6	3	7.3	9	22.0	18	43.9	14	34.1	32	78.0	24	58.5	17	41.5	41	29.9
Less than $140 million	6	10.0	8	13.3	14	23.3	25	41.7	21	35.0	46	76.7	31	51.7	29	48.3	60	43.8
Total	**15**	**10.9**	**13**	**9.5**	**28**	**20.4**	**57**	**41.6**	**52**	**38.0**	**109**	**79.6**	**72**	**52.6**	**65**	**47.4**	**137**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00407
Median	0.00071
Standard Deviation	0.02773
Weighted Average	0.00050
Aggregate T-statistics	1.19072

Panel C: ϕ_i

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	1	4.5	2	9.1	3	13.6	6	27.3	13	59.1	19	86.4	7	31.8	15	68.2	22	16.1
Materials	0	0.0	3	13.0	3	13.0	9	39.1	11	47.8	20	87.0	9	39.1	14	60.9	23	16.8
Industrials	0	0.0	1	6.7	1	6.7	6	40.0	8	53.3	14	93.3	6	40.0	9	60.0	15	10.9
Consumer Discretionary	0	0.0	1	5.9	1	5.9	6	35.3	10	58.8	16	94.1	6	35.3	11	64.7	17	12.4
Consumer Staples	0	0.0	1	14.3	1	14.3	2	28.6	4	57.1	6	85.7	2	28.6	5	71.4	7	5.1
Health Care	2	12.5	2	12.5	4	25.0	5	31.3	7	43.8	12	75.0	7	43.8	9	56.3	16	11.7
Financials	1	5.9	2	11.8	3	17.6	9	52.9	5	29.4	14	82.4	10	58.8	7	41.2	17	12.4
Information Technology	1	7.1	3	21.4	4	28.6	4	28.6	6	42.9	10	71.4	5	35.7	9	64.3	14	10.2
Telecommunication Services	1	33.3	0	0.0	1	33.3	0	0.0	2	66.7	2	66.7	1	33.3	2	66.7	3	2.2
Utilities	0	0.0	1	33.3	1	33.3	0	0.0	2	66.7	2	66.7	0	0.0	3	100.0	3	2.2
Total	**6**	**4.4**	**16**	**11.7**	**22**	**16.1**	**47**	**34.3**	**68**	**49.6**	**115**	**83.9**	**53**	**38.7**	**84**	**61.3**	**137**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	1	2.8	6	16.7	7	19.4	13	36.1	16	44.4	29	80.6	14	38.9	22	61.1	36	26.3
Between $140 million & $280 million	2	4.9	6	14.6	8	19.5	17	41.5	16	39.0	33	80.5	19	46.3	22	53.7	41	29.9
Less than $140 million	3	5.0	4	6.7	7	11.7	17	28.3	36	60.0	53	88.3	20	33.3	40	66.7	60	43.8
Total	**6**	**4.4**	**16**	**11.7**	**22**	**16.1**	**47**	**34.3**	**68**	**49.6**	**115**	**83.9**	**53**	**38.7**	**84**	**61.3**	**137**	**100.0**

Cross-Sectional Statistics	**All**
Average	-0.11819
Median	-0.05211
Standard Deviation	0.38582
Weighted Average	-0.03279
Aggregate T-statistics	-10.00446

Table 8: Cross-sectional Results of Daily Volume Market Model for Deletions

The estimated model is

$$Volturnover_{i,t} = \alpha_i + \beta_{i,0} Volturnover_{m,t} + \beta_{i,2} D2_{i,t} + \varepsilon_{i,t}$$

This table summarize the results for $\beta_{i,2}$ from the above estimated time series model for stocks listed under Deletions from the List of Securities Eligible for Reduced Margin (the list). The stock sample covers the period June 30, 2000 to July 5, 2007. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The definitions of the variables in the model are as follows: $Volturnover_{i,t}$ is the volume on observation i during day t divided by the outstanding shares of the respective month. $Volturnover_{m,t}$ is the equal-weighted volume turnover of all domestic common equalities on TSX during day t. $D2_{i,t}$ is a dummy variable for observation i that take the value 1 five days before, the day of and one day after the effective date and zero elsewhere. $\varepsilon_{i,t}$ is the residual with zero-mean disturbance and unconditional variance. This table categorized the estimated coefficients by the sign and significance and reports the number of the estimated coefficients in each category and the respective percentage within a given industry sector. The significance of the estimated coefficients is determined by t-statistic at 5% significance level. The second part of this table is reported in the same format as the first part. The third part of this table reports the cross-sectional statistics. The aggregate t-statistics is computed as follow: $\sum w_i \hat{\gamma}_i / \sqrt{\sum w_i^2 var(\hat{\gamma}_i)}$,where $w_i = [var(\hat{\gamma}_i)]^{-1} / \sum [var(\hat{\gamma}_i)]^{-1}$ and $var(\hat{\gamma}_i)$ is the square of the standard error of the estimated parameter in the time series regression. Weighted Average is refer to $\sum w_i \hat{\gamma}_i$.

$\beta_{i,2}$

Industry	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	0	0.0	12	42.9	12	42.9	7	25.0	9	32.1	16	57.1	7	25.0	21	75.0	28	17.0
Materials	4	13.8	10	34.5	14	48.3	8	27.6	7	24.1	15	51.7	12	41.4	17	58.6	29	17.6
Industrials	2	11.1	6	33.3	8	44.4	4	22.2	6	33.3	10	55.6	6	33.3	12	66.7	18	10.9
Consumer Discretionary	1	4.8	8	38.1	9	42.9	4	19.0	8	38.1	12	57.1	5	23.8	16	76.2	21	12.7
Consumer Staples	0	0.0	1	12.5	1	12.5	3	37.5	4	50.0	7	87.5	3	37.5	5	62.5	8	4.8
Health Care	2	10.0	5	25.0	7	35.0	8	40.0	5	25.0	13	65.0	10	50.0	10	50.0	20	12.1
Financials	1	5.6	5	27.8	6	33.3	8	44.4	4	22.2	12	66.7	9	50.0	9	50.0	18	10.9
Information Technology	0	0.0	7	41.2	7	41.2	6	35.3	4	23.5	10	58.8	6	35.3	11	64.7	17	10.3
Telecommunication Services	0	0.0	1	33.3	1	33.3	0	0.0	2	66.7	2	66.7	0	0.0	3	100.0	3	1.8
Utilities	0	0.0	0	0.0	0	0.0	1	33.3	2	66.7	3	100.0	1	33.3	2	66.7	3	1.8
Total	**10**	**6.1**	**55**	**33.3**	**65**	**39.4**	**49**	**29.7**	**51**	**30.9**	**100**	**60.6**	**59**	**35.8**	**106**	**64.2**	**165**	**100.0**

Market Capitalization	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	1	2.5	13	32.5	14	35.0	12	30.0	14	35.0	26	65.0	13	32.5	27	67.5	40	24.2
Between $140 million & $280 million	3	6.1	9	18.4	12	24.5	22	44.9	15	30.6	37	75.5	25	51.0	24	49.0	49	29.7
Less than $140 million	6	7.9	33	43.4	39	51.3	15	19.7	22	28.9	37	48.7	21	27.6	55	72.4	76	46.1
Total	**10**	**6.1**	**55**	**33.3**	**65**	**39.4**	**49**	**29.7**	**51**	**30.9**	**100**	**60.6**	**59**	**35.8**	**106**	**64.2**	**165**	**100.0**

Cross-Sectional Statistics	All
Average	-0.01987
Median	-0.02257
Standard Deviation	0.26810
Weighted Average	-0.01596
Aggregate T-statistics	-12.84573

Appendix I

List of Securities Eligible for Reduced Margin

Eligibility Criteria
For the selection of securities eligible for a reduced margin rate, the securities must meet the following criteria.

General Inclusion Requirements

Price volatility measures	- Calculated price volatility margin interval <= 25% - Market value per share >= $2.00 per share
Liquidity measures	- Dollar value of public float greater than $50 million - Average daily trade volume for each month in the quarter >= 10,000 shares per day for at least two out of the three months in the quarter ***OR*** - An equivalent average daily traded value amount for each month in the quarter ended >= $500,000 per day [to accommodate high price securities]
Listing requirements	- Listed on a Canadian exchange for six months ***OR*** - Listed on a Canadian exchange less than six months, with: - Market value per share >= $5.00 per share - Dollar value of public float greater than $500 million; and - In the discretion of IDA staff, the issuer company is in an industry sector known for low price volatility

Other Inclusion Requirements

- A new security listing resulting from an issuer reorganization that:
  - is substantially the same as a previous security listing,
  - has a combined calculated price volatility margin interval for the old and the new listings of <= 25%; and
  - meets all the other *General Inclusion Requirements* for ongoing listings.

  For the purposes of this requirement, the term "substantially the same" means a new security listing that represents between 80% and 120% of the public float of a previous security listing.
- A Canada/United States inter-listed security against which options issued by The Options Clearing Corporation are traded
- A security that is senior to or convertible into a security that meets the *General Inclusion Requirements* or *Other Inclusion Requirements* above

Sources: List of Securities Eligible for Reduced Margin, March 31 2007, page 20; available on www.iiroc.ca

Appendix II

Cross-sectional Results of Daily Return Market Model for Non-Financial Stock in Additions

The estimated model is

$$r_{i,t} = \alpha_i + \beta_{i,} r_{m,t} + \lambda_{i,1} ANN_{i,t} + \lambda_{i,2} EFF_{i,t} + \varepsilon_{i,t},$$

$$\ln(\sigma_{i,t}^2) = w_i + \varphi_i \ln(\sigma_{i,t}^2) + \theta_i \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} + \delta_i \left| \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} \right| + \phi_i POSTANN_{i,t}$$

This table summarize the results for $\lambda_{i,1}$, $\lambda_{i,2}$ and ϕ_i from the above estimated time series model for non-financial stocks listed under Additions from the List of Securities Eligible for Reduced Margin (the list). The stock sample covers the period June 30, 2000 to July 5, 2007. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The definitions of the variables in the model are as follows: $r_{i,t}$ is the return on observation i during day t. $r_{m,t}$ is the return during day t on the CFMRC Index for securities with per share price above \$2. $\varepsilon_{i,t}$ is the zero-mean disturbance. $\sigma_{i,t}^2$ is the conditional variance of the return of firm i at time t. $ANN_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change announcement date and zero elsewhere. $EFF_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change effective date and zero elsewhere. $POSTANN_{i,t}$ take the value 1 starting one day before the margin change announcement date and onward and zero elsewhere. The first part of each panel categorized the estimated coefficients by the sign and significance and reports the number of the estimated coefficients in each category and the respective percentage within a given industry sector. The significance of the estimated coefficients is determined by t-statistic at 5% significance level. The second part of each panel is reported in the same format as the first part. The third part of each panel reports the cross-sectional statistics. The aggregate t-statistics is computed as follow: $\sum w_i \hat{\gamma}_i / \sqrt{\sum w_i^2 var(\hat{\gamma}_i)}$,where $w_i = [var(\hat{\gamma}_i)]^{-1} / \sum [var(\hat{\gamma}_i)]^{-1}$ and $var(\hat{\gamma}_i)$ is the square of the standard error of the estimated parameter in the time series regression. Weighted Average is refer to $\sum w_i \hat{\gamma}_i$.

Panel A: $\lambda_{i,1}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	14	7.7	24	13.2	38	20.9	63	34.6	81	44.5	144	79.1	77	42.3	105	57.7	182	31.1
Materials	22	15.1	20	13.7	42	28.8	46	31.5	58	39.7	104	71.2	68	46.6	78	53.4	146	24.9
Industrials	10	13.9	6	8.3	16	22.2	26	36.1	30	41.7	56	77.8	36	50.0	36	50.0	72	12.3
Consumer Discretionary	3	5.5	4	7.3	7	12.7	18	32.7	30	54.5	48	87.3	21	38.2	34	61.8	55	9.4
Consumer Staples	2	11.8	5	29.4	7	41.2	4	23.5	6	35.3	10	58.8	6	35.3	11	64.7	17	2.9
Health Care	4	10.0	4	10.0	8	20.0	11	27.5	21	52.5	32	80.0	15	37.5	25	62.5	40	6.8
Financials	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	0.0
Information Technology	5	10.6	4	8.5	9	19.1	18	38.3	20	42.6	38	80.9	23	48.9	24	51.1	47	8.0
Telecommunication Services	0	0.0	2	22.2	2	22.2	2	22.2	5	55.6	7	77.8	2	22.2	7	77.8	9	1.5
Utilities	3	16.7	0	0.0	3	16.7	9	50.0	6	33.3	15	83.3	12	66.7	6	33.3	18	3.1
Total	**63**	**10.8**	**69**	**11.8**	**132**	**22.5**	**197**	**33.6**	**257**	**43.9**	**454**	**77.5**	**260**	**44.4**	**326**	**55.6**	**586**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	19	9.8	21	10.8	40	20.6	67	34.5	87	44.8	154	79.4	86	44.3	108	55.7	194	33.1
Between $140 million & $280 million	24	11.5	22	10.6	46	22.1	69	33.2	93	44.7	162	77.9	93	44.7	115	55.3	208	35.5
Less than $140 million	20	10.9	26	14.1	46	25.0	61	33.2	77	41.8	138	75.0	81	44.0	103	56.0	184	31.4
Total	**63**	**10.8**	**69**	**11.8**	**132**	**22.5**	**197**	**33.6**	**257**	**43.9**	**454**	**77.5**	**260**	**44.4**	**326**	**55.6**	**586**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00052
Median	-0.00142
Standard Deviation	0.01765
Weighted Average	-0.00058
Aggregate T-statistics	-2.95301

Panel B: $\lambda_{i,2}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	27	14.8	13	7.1	40	22.0	65	35.7	77	42.3	142	78.0	92	50.5	90	49.5	182	31.1
Materials	14	9.6	22	15.1	36	24.7	52	35.6	58	39.7	110	75.3	66	45.2	80	54.8	146	24.9
Industrials	7	9.7	10	13.9	17	23.6	17	23.6	38	52.8	55	76.4	24	33.3	48	66.7	72	12.3
Consumer Discretionary	3	5.5	6	10.9	9	16.4	29	52.7	17	30.9	46	83.6	32	58.2	23	41.8	55	9.4
Consumer Staples	4	23.5	3	17.6	7	41.2	5	29.4	5	29.4	10	58.8	9	52.9	8	47.1	17	2.9
Health Care	5	12.5	2	5.0	7	17.5	15	37.5	18	45.0	33	82.5	20	50.0	20	50.0	40	6.8
Financials	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	0.0
Information Technology	7	14.9	11	23.4	18	38.3	15	31.9	14	29.8	29	61.7	22	46.8	25	53.2	47	8.0
Telecommunication Services	1	11.1	0	0.0	1	11.1	6	66.7	2	22.2	8	88.9	7	77.8	2	22.2	9	1.5
Utilities	3	16.7	2	11.1	5	27.8	8	44.4	5	27.8	13	72.2	11	61.1	7	38.9	18	3.1
Total	**71**	**12.1**	**69**	**11.8**	**140**	**23.9**	**212**	**36.2**	**234**	**39.9**	**446**	**76.1**	**283**	**48.3**	**303**	**51.7**	**586**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	25	12.9	26	13.4	51	26.3	75	38.7	68	35.1	143	73.7	100	51.5	94	48.5	194	33.1
Between $140 million & $280 million	26	12.5	28	13.5	54	26.0	71	34.1	83	39.9	154	74.0	97	46.6	111	53.4	208	35.5
Less than $140 million	20	10.9	15	8.2	35	19.0	66	35.9	83	45.1	149	81.0	86	46.7	98	53.3	184	31.4
Total	**71**	**12.1**	**69**	**11.8**	**140**	**23.9**	**212**	**36.2**	**234**	**39.9**	**446**	**76.1**	**283**	**48.3**	**303**	**51.7**	**586**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00121
Median	-0.00087
Standard Deviation	0.01773
Weighted Average	-0.00003
Aggregate T-statistics	-0.14330

Panel C: ϕ_i

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	14	7.7	14	7.7	28	15.4	67	36.8	87	47.8	154	84.6	81	44.5	101	55.5	182	31.1
Materials	8	5.5	15	10.3	23	15.8	43	29.5	80	54.8	123	84.2	51	34.9	95	65.1	146	24.9
Industrials	6	8.3	5	6.9	11	15.3	29	40.3	32	44.4	61	84.7	35	48.6	37	51.4	72	12.3
Consumer Discretionary	4	7.3	4	7.3	8	14.5	24	43.6	23	41.8	47	85.5	28	50.9	27	49.1	55	9.4
Consumer Staples	0	0.0	0	0.0	0	0.0	7	41.2	10	58.8	17	100.0	7	41.2	10	58.8	17	2.9
Health Care	1	2.5	4	10.0	5	12.5	11	27.5	24	60.0	35	87.5	12	30.0	28	70.0	40	6.8
Financials	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	0.0
Information Technology	1	2.1	5	10.6	6	12.8	16	34.0	25	53.2	41	87.2	17	36.2	30	63.8	47	8.0
Telecommunication Services	0	0.0	2	22.2	2	22.2	2	22.2	5	55.6	7	77.8	2	22.2	7	77.8	9	1.5
Utilities	1	5.6	2	11.1	3	16.7	9	50.0	6	33.3	15	83.3	10	55.6	8	44.4	18	3.1
Total	**35**	**6.0**	**51**	**8.7**	**86**	**14.7**	**208**	**35.5**	**292**	**49.8**	**500**	**85.3**	**243**	**41.5**	**343**	**58.5**	**586**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	13	6.7	21	10.8	34	17.5	58	29.9	102	52.6	160	82.5	71	36.6	123	63.4	194	33.1
Between $140 million & $280 million	15	7.2	14	6.7	29	13.9	87	41.8	92	44.2	179	86.1	102	49.0	106	51.0	208	35.5
Less than $140 million	7	3.8	16	8.7	23	12.5	63	34.2	98	53.3	161	87.5	70	38.0	114	62.0	184	31.4
Total	**35**	**6.0**	**51**	**8.7**	**86**	**14.7**	**208**	**35.5**	**292**	**49.8**	**500**	**85.3**	**243**	**41.5**	**343**	**58.5**	**586**	**100.0**

Cross-Sectional Statistics	**All**
Average	-0.09632
Median	-0.03175
Standard Deviation	0.47343
Weighted Average	-0.00251
Aggregate T-statistics	-2.00015

Appendix III

Cross-sectional Results of Daily Return Market Model for Non-Financial Stock in Deletions

The estimated model is

$$r_{i,t} = \alpha_i + \beta_{i,} r_{m,t} + \lambda_{i,1} ANN_{i,t} + \lambda_{i,2} EFF_{i,t} + \varepsilon_{i,t},$$

$$\ln(\sigma_{i,t}^2) = w_i + \varphi_i \ln(\sigma_{i,t}^2) + \theta_i \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} + \delta_i \left|\frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}}\right| + \phi_i POSTANN_{i,t}$$

This table summarize the results for $\lambda_{i,1}$, $\lambda_{i,2}$ and ϕ_i from the above estimated time series model for non-financial stocks listed under Deletions from the List of Securities Eligible for Reduced Margin (the list). The stock sample covers the period June 30, 2000 to July 5, 2007. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The definitions of the variables in the model are as follows: $r_{i,t}$ is the return on observation i during day t. $r_{m,t}$ is the return during day t on the CFMRC Index for securities with per share price above \$2. $\varepsilon_{i,t}$ is the zero-mean disturbance. $\sigma_{i,t}^2$ is the conditional variance of the return of firm i at time t. $ANN_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change announcement date and zero elsewhere. $EFF_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change effective date and zero elsewhere. $POSTANN_{i,t}$ take the value 1 starting one day before the margin change announcement date and onward and zero elsewhere. The first part of each panel categorized the estimated coefficients by the sign and significance and reports the number of the estimated coefficients in each category and the respective percentage within a given industry sector. The significance of the estimated coefficients is determined by t-statistic at 5% significance level. The second part of each panel is reported in the same format as the first part. The third part of each panel reports the cross-sectional statistics. The aggregate t-statistics is computed as follow: $\sum w_i \hat{\gamma}_i / \sqrt{\sum w_i^2 var(\hat{\gamma}_i)}$,where $w_i = [var(\hat{\gamma}_i)]^{-1} / \sum [var(\hat{\gamma}_i)]^{-1}$ and $var(\hat{\gamma}_i)$ is the square of the standard error of the estimated parameter in the time series regression. Weighted Average is refer to $\sum w_i \hat{\gamma}_i$.

Panel A: $\lambda_{i,1}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	1	4.5	3	13.6	4	18.2	11	50.0	7	31.8	18	81.8	12	54.5	10	45.5	22	18.3
Materials	2	8.7	2	8.7	4	17.4	10	43.5	9	39.1	19	82.6	12	52.2	11	47.8	23	19.2
Industrials	1	6.7	1	6.7	2	13.3	7	46.7	6	40.0	13	86.7	8	53.3	7	46.7	15	12.5
Consumer Discretionary	0	0.0	3	17.6	3	17.6	5	29.4	9	52.9	14	82.4	5	29.4	12	70.6	17	14.2
Consumer Staples	0	0.0	1	14.3	1	14.3	5	71.4	1	14.3	6	85.7	5	71.4	2	28.6	7	5.8
Health Care	2	12.5	3	18.8	5	31.3	7	43.8	4	25.0	11	68.8	9	56.3	7	43.8	16	13.3
Financials	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	0.0
Information Technology	1	7.1	0	0.0	1	7.1	6	42.9	7	50.0	13	92.9	7	50.0	7	50.0	14	11.7
Telecommunication Services	0	0.0	0	0.0	0	0.0	1	33.3	2	66.7	3	100.0	1	33.3	2	66.7	3	2.5
Utilities	0	0.0	0	0.0	0	0.0	2	66.7	1	33.3	3	100.0	2	66.7	1	33.3	3	2.5
Total	**7**	**5.8**	**13**	**10.8**	**20**	**16.7**	**54**	**45.0**	**46**	**38.3**	**100**	**83.3**	**61**	**50.8**	**59**	**49.2**	**120**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	0	0.0	2	6.3	2	6.3	18	56.3	12	37.5	30	93.8	18	56.3	14	43.8	32	26.7
Between $140 million & $280 million	5	15.6	2	6.3	7	21.9	15	46.9	10	31.3	25	78.1	20	62.5	12	37.5	32	26.7
Less than $140 million	2	3.6	9	16.1	11	19.6	21	37.5	24	42.9	45	80.4	23	41.1	33	58.9	56	46.7
Total	**7**	**5.8**	**13**	**10.8**	**20**	**16.7**	**54**	**45.0**	**46**	**38.3**	**100**	**83.3**	**61**	**50.8**	**59**	**49.2**	**120**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00093
Median	0.00033
Standard Deviation	0.02697
Weighted Average	-0.00182
Aggregate T-statistics	-4.13537

Panel B: $\lambda_{i,2}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	2	9.1	2	9.1	4	18.2	10	45.5	8	36.4	18	81.8	12	54.5	10	45.5	22	18.3
Materials	3	13.0	1	4.3	4	17.4	10	43.5	9	39.1	19	82.6	13	56.5	10	43.5	23	19.2
Industrials	1	6.7	1	6.7	2	13.3	9	60.0	4	26.7	13	86.7	10	66.7	5	33.3	15	12.5
Consumer Discretionary	2	11.8	3	17.6	5	29.4	3	17.6	9	52.9	12	70.6	5	29.4	12	70.6	17	14.2
Consumer Staples	0	0.0	0	0.0	0	0.0	5	71.4	2	28.6	7	100.0	5	71.4	2	28.6	7	5.8
Health Care	3	18.8	3	18.8	6	37.5	6	37.5	4	25.0	10	62.5	9	56.3	7	43.8	16	13.3
Financials	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	0.0
Information Technology	3	21.4	2	14.3	5	35.7	5	35.7	4	28.6	9	64.3	8	57.1	6	42.9	14	11.7
Telecommunication Services	0	0.0	0	0.0	0	0.0	3	100.0	0	0.0	3	100.0	3	100.0	0	0.0	3	2.5
Utilities	0	0.0	0	0.0	0	0.0	1	33.3	2	66.7	3	100.0	1	33.3	2	66.7	3	2.5
Total	**14**	**11.7**	**12**	**10.0**	**26**	**21.7**	**52**	**43.3**	**42**	**35.0**	**94**	**78.3**	**66**	**55.0**	**54**	**45.0**	**120**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	3	9.4	2	6.3	5	15.6	13	40.6	14	43.8	27	84.4	16	50.0	16	50.0	32	26.7
Between $140 million & $280 million	5	15.6	2	6.3	7	21.9	15	46.9	10	31.3	25	78.1	20	62.5	12	37.5	32	26.7
Less than $140 million	6	10.7	8	14.3	14	25.0	24	42.9	18	32.1	42	75.0	30	53.6	26	46.4	56	46.7
Total	**14**	**11.7**	**12**	**10.0**	**26**	**21.7**	**52**	**43.3**	**42**	**35.0**	**94**	**78.3**	**66**	**55.0**	**54**	**45.0**	**120**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00472
Median	0.00337
Standard Deviation	0.02942
Weighted Average	0.00068
Aggregate T-statistics	1.27219

Panel C: ϕ_i

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	1	4.5	2	9.1	3	13.6	6	27.3	13	59.1	19	86.4	7	31.8	15	68.2	22	18.3
Materials	0	0.0	3	13.0	3	13.0	9	39.1	11	47.8	20	87.0	9	39.1	14	60.9	23	19.2
Industrials	0	0.0	1	6.7	1	6.7	6	40.0	8	53.3	14	93.3	6	40.0	9	60.0	15	12.5
Consumer Discretionary	0	0.0	1	5.9	1	5.9	6	35.3	10	58.8	16	94.1	6	35.3	11	64.7	17	14.2
Consumer Staples	0	0.0	1	14.3	1	14.3	2	28.6	4	57.1	6	85.7	2	28.6	5	71.4	7	5.8
Health Care	2	12.5	2	12.5	4	25.0	5	31.3	7	43.8	12	75.0	7	43.8	9	56.3	16	13.3
Financials	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	0.0
Information Technology	1	7.1	3	21.4	4	28.6	4	28.6	6	42.9	10	71.4	5	35.7	9	64.3	14	11.7
Telecommunication Services	1	33.3	0	0.0	1	33.3	0	0.0	2	66.7	2	66.7	1	33.3	2	66.7	3	2.5
Utilities	0	0.0	1	33.3	1	33.3	0	0.0	2	66.7	2	66.7	0	0.0	3	100.0	3	2.5
Total	**5**	**4.2**	**14**	**11.7**	**19**	**15.8**	**38**	**31.7**	**63**	**52.5**	**101**	**84.2**	**43**	**35.8**	**77**	**64.2**	**120**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	1	3.1	6	18.8	7	21.9	12	37.5	13	40.6	25	78.1	13	40.6	19	59.4	32	26.7
Between $140 million & $280 million	2	6.3	4	12.5	6	18.8	11	34.4	15	46.9	26	81.3	13	40.6	19	59.4	32	26.7
Less than $140 million	2	3.6	4	7.1	6	10.7	15	26.8	35	62.5	50	89.3	17	30.4	39	69.6	56	46.7
Total	**5**	**4.2**	**14**	**11.7**	**19**	**15.8**	**38**	**31.7**	**63**	**52.5**	**101**	**84.2**	**43**	**35.8**	**77**	**64.2**	**120**	**100.0**

Cross-Sectional Statistics	**All**
Average	-0.11978
Median	-0.05884
Standard Deviation	0.37919
Weighted Average	-0.03330
Aggregate T-statistics	-10.11001

Appendix IV

Cross-sectional Results of Daily Return Market Model: with Industrial Index for Additions

The estimated model is

$$r_{i,t} = \alpha_i + \beta_{i,} r_{m,t} + \beta_{i,1} r_{GICS,t} + \lambda_{i,1} ANN_{i,t} + \lambda_{i,2} EFF_{i,t} + \varepsilon_{i,t},$$

$$\ln(\sigma_{i,t}^2) = w_i + \varphi_i \ln(\sigma_{i,t}^2) + \theta_i \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} + \delta_i \left|\frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}}\right| + \phi_i POSTANN_{i,t}$$

This table summarize the results for $\lambda_{i,1}$, $\lambda_{i,2}$ and ϕ_i from the above estimated time series model for stocks listed under Additions from the List of Securities Eligible for Reduced Margin (the list). The stock sample covers the period June 30, 2000 to July 5, 2007. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The definitions of the variables in the model are as follows: $r_{i,t}$ is the return on observation i during day t. $r_{m,t}$ is the return during day t on the CFMRC Index for securities with per share price above \$2. $r_{GICS,t}$ is the return on the Industrial Index of observation i during day t. $\varepsilon_{i,t}$ is the zero-mean disturbance. $\sigma_{i,t}^2$ is the conditional variance of the return of firm i at time t. $ANN_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change announcement date and zero elsewhere. $EFF_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change effective date and zero elsewhere. $POSTANN_{i,t}$ take the value 1 starting one day before the margin change announcement date and onward and zero elsewhere. The first part of each panel categorized the estimated coefficients by the sign and significance and reports the number of the estimated coefficients in each category and the respective percentage within a given industry sector. The significance of the estimated coefficients is determined by t-statistic at 5% significance level. The second part of each panel is reported in the same format as the first part. The third part of each panel reports the cross-sectional statistics. The aggregate t-statistics is computed as follow: $\sum w_i \hat{\gamma}_i / \sqrt{\sum w_i^2 var(\hat{\gamma}_i)}$,where $w_i = [var(\hat{\gamma}_i)]^{-1} / \sum [var(\hat{\gamma}_i)]^{-1}$ and $var(\hat{\gamma}_i)$ is the square of the standard error of the estimated parameter in the time series regression. Weighted Average is refer to $\sum w_i \hat{\gamma}_i$.

Panel A: $\lambda_{i,1}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	19	10.9	19	10.9	38	21.7	58	33.1	79	45.1	137	78.3	77	44.0	98	56.0	175	27.2
Materials	19	12.8	19	12.8	38	25.5	54	36.2	57	38.3	111	74.5	73	49.0	76	51.0	149	23.1
Industrials	10	13.3	8	10.7	18	24.0	28	37.3	29	38.7	57	76.0	38	50.7	37	49.3	75	11.6
Consumer Discretionary	3	5.3	3	5.3	6	10.5	18	31.6	33	57.9	51	89.5	21	36.8	36	63.2	57	8.9
Consumer Staples	2	11.8	5	29.4	7	41.2	3	17.6	7	41.2	10	58.8	5	29.4	12	70.6	17	2.6
Health Care	3	7.7	5	12.8	8	20.5	12	30.8	19	48.7	31	79.5	15	38.5	24	61.5	39	6.1
Financials	5	8.2	4	6.6	9	14.8	31	50.8	21	34.4	52	85.2	36	59.0	25	41.0	61	9.5
Information Technology	7	15.6	3	6.7	10	22.2	14	31.1	21	46.7	35	77.8	21	46.7	24	53.3	45	7.0
Telecommunication Services	0	0.0	2	28.6	2	28.6	2	28.6	3	42.9	5	71.4	2	28.6	5	71.4	7	1.1
Utilities	2	10.5	0	0.0	2	10.5	11	57.9	6	31.6	17	89.5	13	68.4	6	31.6	19	3.0
Total	**70**	**10.9**	**68**	**10.6**	**138**	**21.4**	**231**	**35.9**	**275**	**42.7**	**506**	**78.6**	**301**	**46.7**	**343**	**53.3**	**644**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	21	9.5	19	8.6	40	18.1	83	37.6	98	44.3	181	81.9	104	47.1	117	52.9	221	34.3
Between $140 million & $280 million	27	12.1	21	9.4	48	21.5	77	34.5	98	43.9	175	78.5	104	46.6	119	53.4	223	34.6
Less than $140 million	22	11.0	28	14.0	50	25.0	71	35.5	79	39.5	150	75.0	93	46.5	107	53.5	200	31.1
Total	**70**	**10.9**	**68**	**10.6**	**138**	**21.4**	**231**	**35.9**	**275**	**42.7**	**506**	**78.6**	**301**	**46.7**	**343**	**53.3**	**644**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00121
Median	-0.00082
Standard Deviation	0.01665
Weighted Average	-0.00050
Aggregate T-statistics	-2.70918

Panel B: $\lambda_{i,2}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	21	12.0	12	6.9	33	18.9	68	38.9	74	42.3	142	81.1	89	50.9	86	49.1	175	27.2
Materials	18	12.1	23	15.4	41	27.5	51	34.2	57	38.3	108	72.5	69	46.3	80	53.7	149	23.1
Industrials	7	9.3	10	13.3	17	22.7	18	24.0	40	53.3	58	77.3	25	33.3	50	66.7	75	11.6
Consumer Discretionary	4	7.0	6	10.5	10	17.5	31	54.4	16	28.1	47	82.5	35	61.4	22	38.6	57	8.9
Consumer Staples	5	29.4	3	17.6	8	47.1	5	29.4	4	23.5	9	52.9	10	58.8	7	41.2	17	2.6
Health Care	6	15.4	3	7.7	9	23.1	14	35.9	16	41.0	30	76.9	20	51.3	19	48.7	39	6.1
Financials	10	16.4	4	6.6	14	23.0	24	39.3	23	37.7	47	77.0	34	55.7	27	44.3	61	9.5
Information Technology	6	13.3	7	15.6	13	28.9	14	31.1	18	40.0	32	71.1	20	44.4	25	55.6	45	7.0
Telecommunication Services	1	14.3	0	0.0	1	14.3	5	71.4	1	14.3	6	85.7	6	85.7	1	14.3	7	1.1
Utilities	3	15.8	2	10.5	5	26.3	8	42.1	6	31.6	14	73.7	11	57.9	8	42.1	19	3.0
Total	**81**	**12.6**	**70**	**10.9**	**151**	**23.4**	**238**	**37.0**	**255**	**39.6**	**493**	**76.6**	**319**	**49.5**	**325**	**50.5**	**644**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	31	14.0	25	11.3	56	25.3	82	37.1	83	37.6	165	74.7	113	51.1	108	48.9	221	34.3
Between $140 million & $280 million	25	11.2	30	13.5	55	24.7	87	39.0	81	36.3	168	75.3	112	50.2	111	49.8	223	34.6
Less than $140 million	25	12.5	15	7.5	40	20.0	69	34.5	91	45.5	160	80.0	94	47.0	106	53.0	200	31.1
Total	**81**	**12.6**	**70**	**10.9**	**151**	**23.4**	**238**	**37.0**	**255**	**39.6**	**493**	**76.6**	**319**	**49.5**	**325**	**50.5**	**644**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00204
Median	-0.00010
Standard Deviation	0.01797
Weighted Average	0.00042
Aggregate T-statistics	2.28162

Panel C: ϕ_i

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	9	5.1	18	10.3	27	15.4	66	37.7	82	46.9	148	84.6	75	42.9	100	57.1	175	27.2
Materials	5	3.4	17	11.4	22	14.8	53	35.6	74	49.7	127	85.2	58	38.9	91	61.1	149	23.1
Industrials	5	6.7	7	9.3	12	16.0	33	44.0	30	40.0	63	84.0	38	50.7	37	49.3	75	11.6
Consumer Discretionary	4	7.0	5	8.8	9	15.8	24	42.1	24	42.1	48	84.2	28	49.1	29	50.9	57	8.9
Consumer Staples	0	0.0	2	11.8	2	11.8	7	41.2	8	47.1	15	88.2	7	41.2	10	58.8	17	2.6
Health Care	1	2.6	5	12.8	6	15.4	8	20.5	25	64.1	33	84.6	9	23.1	30	76.9	39	6.1
Financials	2	3.3	2	3.3	4	6.6	24	39.3	33	54.1	57	93.4	26	42.6	35	57.4	61	9.5
Information Technology	3	6.7	3	6.7	6	13.3	16	35.6	23	51.1	39	86.7	19	42.2	26	57.8	45	7.0
Telecommunication Services	0	0.0	2	28.6	2	28.6	2	28.6	3	42.9	5	71.4	2	28.6	5	71.4	7	1.1
Utilities	1	5.3	2	10.5	3	15.8	9	47.4	7	36.8	16	84.2	10	52.6	9	47.4	19	3.0
Total	**30**	**4.7**	**63**	**9.8**	**93**	**14.4**	**242**	**37.6**	**309**	**48.0**	**551**	**85.6**	**272**	**42.2**	**372**	**57.8**	**644**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	15	6.8	24	10.9	39	17.6	73	33.0	109	49.3	182	82.4	88	39.8	133	60.2	221	34.3
Between $140 million & $280 million	8	3.6	20	9.0	28	12.6	104	46.6	91	40.8	195	87.4	112	50.2	111	49.8	223	34.6
Less than $140 million	7	3.5	19	9.5	26	13.0	65	32.5	109	54.5	174	87.0	72	36.0	128	64.0	200	31.1
Total	**30**	**4.7**	**63**	**9.8**	**93**	**14.4**	**242**	**37.6**	**309**	**48.0**	**551**	**85.6**	**272**	**42.2**	**372**	**57.8**	**644**	**100.0**

Cross-Sectional Statistics	**All**
Average	-0.08188
Median	-0.02359
Standard Deviation	0.46200
Weighted Average	-0.00388
Aggregate T-statistics	-3.21526

Appendix V

Cross-sectional Results of Daily Return Market Model: with Industrial Index for Deletions

The estimated model is

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \beta_{i,1} r_{GICS,t} + \lambda_{i,1} ANN_{i,t} + \lambda_{i,2} EFF_{i,t} + \varepsilon_{i,t},$$

$$\ln(\sigma_{i,t}^2) = w_i + \varphi_i \ln(\sigma_{i,t}^2) + \theta_i \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} + \delta_i \left| \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} \right| + \phi_i POSTANN_{i,t}$$

This table summarize the results for $\lambda_{i,1}$, $\lambda_{i,2}$ and ϕ_i from the above estimated time series model for stocks listed under Deletions from the List of Securities Eligible for Reduced Margin (the list). The stock sample covers the period June 30, 2000 to July 5, 2007. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The definitions of the variables in the model are as follows: $r_{i,t}$ is the return on observation i during day t. $r_{m,t}$ is the return during day t on the CFMRC Index for securities with per share price above $2. $r_{GICS,t}$ is the return on the Industrial Index of observation i during day t. $\varepsilon_{i,t}$ is the zero-mean disturbance. $\sigma_{i,t}^2$ is the conditional variance of the return of firm i at time t. $ANN_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change announcement date and zero elsewhere. $EFF_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change effective date and zero elsewhere. $POSTANN_{i,t}$ take the value 1 starting one day before the margin change announcement date and onward and zero elsewhere. The first part of each panel categorized the estimated coefficients by the sign and significance and reports the number of the estimated coefficients in each category and the respective percentage within a given industry sector. The significance of the estimated coefficients is determined by t-statistic at 5% significance level. The second part of each panel is reported in the same format as the first part. The third part of each panel reports the cross-sectional statistics. The aggregate t-statistics is computed as follow: $\sum w_i \hat{\gamma}_i / \sqrt{\sum w_i^2 var(\hat{\gamma}_i)}$,where $w_i = [var(\hat{\gamma}_i)]^{-1} / \sum [var(\hat{\gamma}_i)]^{-1}$ and $var(\hat{\gamma}_i)$ is the square of the standard error of the estimated parameter in the time series regression. Weighted Average is refer to $\sum w_i \hat{\gamma}_i$.

Panel A: $\lambda_{i,1}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	3	13.6	3	13.6	6	27.3	12	54.5	4	18.2	16	72.7	15	68.2	7	31.8	22	16.3
Materials	0	0.0	3	12.0	3	12.0	12	48.0	10	40.0	22	88.0	12	48.0	13	52.0	25	18.5
Industrials	2	13.3	1	6.7	3	20.0	7	46.7	5	33.3	12	80.0	9	60.0	6	40.0	15	11.1
Consumer Discretionary	1	5.9	3	17.6	4	23.5	7	41.2	6	35.3	13	76.5	8	47.1	9	52.9	17	12.6
Consumer Staples	0	0.0	1	14.3	1	14.3	5	71.4	1	14.3	6	85.7	5	71.4	2	28.6	7	5.2
Health Care	3	17.6	3	17.6	6	35.3	5	29.4	6	35.3	11	64.7	8	47.1	9	52.9	17	12.6
Financials	2	13.3	1	6.7	3	20.0	6	40.0	6	40.0	12	80.0	8	53.3	7	46.7	15	11.1
Information Technology	1	8.3	0	0.0	1	8.3	4	33.3	7	58.3	11	91.7	5	41.7	7	58.3	12	8.9
Telecommunication Services	0	0.0	0	0.0	0	0.0	1	50.0	1	50.0	2	100.0	1	50.0	1	50.0	2	1.5
Utilities	0	0.0	0	0.0	0	0.0	2	66.7	1	33.3	3	100.0	2	66.7	1	33.3	3	2.2
Total	**12**	**8.9**	**15**	**11.1**	**27**	**20.0**	**61**	**45.2**	**47**	**34.8**	**108**	**80.0**	**73**	**54.1**	**62**	**45.9**	**135**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	1	2.9	2	5.9	3	8.8	20	58.8	11	32.4	31	91.2	21	61.8	13	38.2	34	25.2
Between $140 million & $280 million	5	13.2	4	10.5	9	23.7	20	52.6	9	23.7	29	76.3	25	65.8	13	34.2	38	28.1
Less than $140 million	6	9.5	9	14.3	15	23.8	21	33.3	27	42.9	48	76.2	27	42.9	36	57.1	63	46.7
Total	**12**	**8.9**	**15**	**11.1**	**27**	**20.0**	**61**	**45.2**	**47**	**34.8**	**108**	**80.0**	**73**	**54.1**	**62**	**45.9**	**135**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00001
Median	0.00076
Standard Deviation	0.02652
Weighted Average	-0.00168
Aggregate T-statistics	-3.79277

Panel B: $\lambda_{i,2}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	4	18.2	1	4.5	5	22.7	9	40.9	8	36.4	17	77.3	13	59.1	9	40.9	22	16.3
Materials	3	12.0	1	4.0	4	16.0	12	48.0	9	36.0	21	84.0	15	60.0	10	40.0	25	18.5
Industrials	0	0.0	2	13.3	2	13.3	10	66.7	3	20.0	13	86.7	10	66.7	5	33.3	15	11.1
Consumer Discretionary	2	11.8	2	11.8	4	23.5	4	23.5	9	52.9	13	76.5	6	35.3	11	64.7	17	12.6
Consumer Staples	0	0.0	0	0.0	0	0.0	5	71.4	2	28.6	7	100.0	5	71.4	2	28.6	7	5.2
Health Care	3	17.6	3	17.6	6	35.3	7	41.2	4	23.5	11	64.7	10	58.8	7	41.2	17	12.6
Financials	2	13.3	0	0.0	2	13.3	4	26.7	9	60.0	13	86.7	6	40.0	9	60.0	15	11.1
Information Technology	3	25.0	2	16.7	5	41.7	4	33.3	3	25.0	7	58.3	7	58.3	5	41.7	12	8.9
Telecommunication Services	0	0.0	0	0.0	0	0.0	2	100.0	0	0.0	2	100.0	2	100.0	0	0.0	2	1.5
Utilities	0	0.0	0	0.0	0	0.0	1	33.3	2	66.7	3	100.0	1	33.3	2	66.7	3	2.2
Total	**17**	**12.6**	**11**	**8.1**	**28**	**20.7**	**58**	**43.0**	**49**	**36.3**	**107**	**79.3**	**75**	**55.6**	**60**	**44.4**	**135**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	3	8.8	3	8.8	6	17.6	13	38.2	15	44.1	28	82.4	16	47.1	18	52.9	34	25.2
Between $140 million & $280 million	6	15.8	1	2.6	7	18.4	16	42.1	15	39.5	31	81.6	22	57.9	16	42.1	38	28.1
Less than $140 million	8	12.7	7	11.1	15	23.8	29	46.0	19	30.2	48	76.2	37	58.7	26	41.3	63	46.7
Total	**17**	**12.6**	**11**	**8.1**	**28**	**20.7**	**58**	**43.0**	**49**	**36.3**	**107**	**79.3**	**75**	**55.6**	**60**	**44.4**	**135**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00512
Median	0.00300
Standard Deviation	0.02628
Weighted Average	0.00034
Aggregate T-statistics	0.76301

Panel C: ϕ_i

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	2	9.1	3	13.6	5	22.7	6	27.3	11	50.0	17	77.3	8	36.4	14	63.6	22	16.3
Materials	0	0.0	2	8.0	2	8.0	11	44.0	12	48.0	23	92.0	11	44.0	14	56.0	25	18.5
Industrials	0	0.0	1	6.7	1	6.7	8	53.3	6	40.0	14	93.3	8	53.3	7	46.7	15	11.1
Consumer Discretionary	0	0.0	3	17.6	3	17.6	3	17.6	11	64.7	14	82.4	3	17.6	14	82.4	17	12.6
Consumer Staples	0	0.0	1	14.3	1	14.3	3	42.9	3	42.9	6	85.7	3	42.9	4	57.1	7	5.2
Health Care	2	11.8	1	5.9	3	17.6	6	35.3	8	47.1	14	82.4	8	47.1	9	52.9	17	12.6
Financials	1	6.7	2	13.3	3	20.0	9	60.0	3	20.0	12	80.0	10	66.7	5	33.3	15	11.1
Information Technology	1	8.3	1	8.3	2	16.7	4	33.3	6	50.0	10	83.3	5	41.7	7	58.3	12	8.9
Telecommunication Services	0	0.0	0	0.0	0	0.0	0	0.0	2	100.0	2	100.0	0	0.0	2	100.0	2	1.5
Utilities	0	0.0	1	33.3	1	33.3	0	0.0	2	66.7	2	66.7	0	0.0	3	100.0	3	2.2
Total	**6**	**4.4**	**15**	**11.1**	**21**	**15.6**	**50**	**37.0**	**64**	**47.4**	**114**	**84.4**	**56**	**41.5**	**79**	**58.5**	**135**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	2	5.9	5	14.7	7	20.6	12	35.3	15	44.1	27	79.4	14	41.2	20	58.8	34	25.2
Between $140 million & $280 million	1	2.6	6	15.8	7	18.4	15	39.5	16	42.1	31	81.6	16	42.1	22	57.9	38	28.1
Less than $140 million	3	4.8	4	6.3	7	11.1	23	36.5	33	52.4	56	88.9	26	41.3	37	58.7	63	46.7
Total	**6**	**4.4**	**15**	**11.1**	**21**	**15.6**	**50**	**37.0**	**64**	**47.4**	**114**	**84.4**	**56**	**41.5**	**79**	**58.5**	**135**	**100.0**

Cross-Sectional Statistics	**All**
Average	-0.11678
Median	-0.03249
Standard Deviation	0.46146
Weighted Average	-0.02084
Aggregate T-statistics	-5.13278

Appendix VI

Cross-sectional Results of Daily Return Market Model: with Ten Industrial Indexes for Additions

We estimate the following E-GARCH model

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \sum_{k=1}^{10} \delta_{i,k} r_{k,t} + \lambda_{i,1} ANN_{i,t} + \lambda_{i,2} EFF_{i,t} + \varepsilon_{i,t}$$

$$\ln(\sigma_{i,t}^2) = w_i + \varphi_i \ln(\sigma_{i,t-1}^2) + \theta_i \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} + \delta_i \left| \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} \right| + \phi_i POSTANN_{i,t}$$

This table summarize the results for $\lambda_{i,1}$, $\lambda_{i,2}$ and ϕ_i from the above estimated time series model for stocks listed under Additions from the List of Securities Eligible for Reduced Margin (the list). The stock sample covers the period June 30, 2000 to July 5, 2007. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The definitions of the variables in the model are as follows: $r_{i,t}$ is the return on observation i during day t. $r_{m,t}$ is the return during day t on the CFMRC Index for securities with per share price above \$2. $r_{k,t}$ is the return on sector portfolio k for day t. $\varepsilon_{i,t}$ is the zero-mean disturbance. $\sigma_{i,t}^2$ is the conditional variance of the return of firm i at time t. $ANN_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change announcement date and zero elsewhere. $EFF_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change effective date and zero elsewhere. $POSTANN_{i,t}$ take the value 1 starting one day before the margin change announcement date and onward and zero elsewhere. The first part of each panel categorized the estimated coefficients by the sign and significance and reports the number of the estimated coefficients in each category and the respective percentage within a given industry sector. The significance of the estimated coefficients is determined by t-statistic at 5% significance level. The second part of each panel is reported in the same format as the first part. The third part of each panel reports the cross-sectional statistics. The aggregate t-statistics is computed as follow: $\sum w_i \hat{\gamma}_i / \sqrt{\sum w_i^2 var(\hat{\gamma}_i)}$,where $w_i = [var(\hat{\gamma}_i)]^{-1} / \sum [var(\hat{\gamma}_i)]^{-1}$ and $var(\hat{\gamma}_i)$ is the square of the standard error of the estimated parameter in the time series regression. Weighted Average is refer to $\sum w_i \hat{\gamma}_i$.

Panel A: $\lambda_{i,1}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	17	9.8	16	9.2	33	19.0	67	38.5	74	42.5	141	81.0	84	48.3	90	51.7	174	28.9
Materials	15	11.4	14	10.6	29	22.0	58	43.9	45	34.1	103	78.0	73	55.3	59	44.7	132	21.9
Industrials	10	14.9	7	10.4	17	25.4	27	40.3	23	34.3	50	74.6	37	55.2	30	44.8	67	11.1
Consumer Discretionary	5	8.9	6	10.7	11	19.6	19	33.9	26	46.4	45	80.4	24	42.9	32	57.1	56	9.3
Consumer Staples	2	11.8	4	23.5	6	35.3	4	23.5	7	41.2	11	64.7	6	35.3	11	64.7	17	2.8
Health Care	2	5.6	4	11.1	6	16.7	12	33.3	18	50.0	30	83.3	14	38.9	22	61.1	36	6.0
Financials	3	5.5	5	9.1	8	14.5	31	56.4	16	29.1	47	85.5	34	61.8	21	38.2	55	9.1
Information Technology	4	9.5	2	4.8	6	14.3	21	50.0	15	35.7	36	85.7	25	59.5	17	40.5	42	7.0
Telecommunication Services	0	0.0	0	0.0	0	0.0	3	50.0	3	50.0	6	100.0	3	50.0	3	50.0	6	1.0
Utilities	2	11.8	0	0.0	2	11.8	9	52.9	6	35.3	15	88.2	11	64.7	6	35.3	17	2.8
Total	**60**	**10.0**	**58**	**9.6**	**118**	**19.6**	**251**	**41.7**	**233**	**38.7**	**484**	**80.4**	**311**	**51.7**	**291**	**48.3**	**602**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	20	10.1	18	9.0	38	19.1	82	41.2	79	39.7	161	80.9	102	51.3	97	48.7	199	33.1
Between $140 million & $280 million	21	9.9	20	9.4	41	19.2	89	41.8	83	39.0	172	80.8	110	51.6	103	48.4	213	35.4
Less than $140 million	19	10.0	20	10.5	39	20.5	80	42.1	71	37.4	151	79.5	99	52.1	91	47.9	190	31.6
Total	**60**	**10.0**	**58**	**9.6**	**118**	**19.6**	**251**	**41.7**	**233**	**38.7**	**484**	**80.4**	**311**	**51.7**	**291**	**48.3**	**602**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00116
Median	0.00025
Standard Deviation	0.01615
Weighted Average	0.00021
Aggregate T-statistics	1.06210

Panel B: $\lambda_{i,2}$

Industry	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	29	16.7	17	9.8	46	26.4	67	38.5	61	35.1	128	73.6	96	55.2	78	44.8	174	29.0
Materials	10	7.6	19	14.5	29	22.1	55	42.0	47	35.9	102	77.9	65	49.6	66	50.4	131	21.8
Industrials	7	10.4	7	10.4	14	20.9	20	29.9	33	49.3	53	79.1	27	40.3	40	59.7	67	11.1
Consumer Discretionary	3	5.4	5	8.9	8	14.3	28	50.0	20	35.7	48	85.7	31	55.4	25	44.6	56	9.3
Consumer Staples	2	11.8	4	23.5	6	35.3	7	41.2	4	23.5	11	64.7	9	52.9	8	47.1	17	2.8
Health Care	7	19.4	2	5.6	9	25.0	10	27.8	17	47.2	27	75.0	17	47.2	19	52.8	36	6.0
Financials	10	18.2	3	5.5	13	23.6	25	45.5	17	30.9	42	76.4	35	63.6	20	36.4	55	9.2
Information Technology	4	9.5	8	19.0	12	28.6	12	28.6	18	42.9	30	71.4	16	38.1	26	61.9	42	7.0
Telecommunication Services	1	16.7	0	0.0	1	16.7	4	66.7	1	16.7	5	83.3	5	83.3	1	16.7	6	1.0
Utilities	2	11.8	0	0.0	2	11.8	7	41.2	8	47.1	15	88.2	9	52.9	8	47.1	17	2.8
Total	**75**	**12.5**	**65**	**10.8**	**140**	**23.3**	**235**	**39.1**	**226**	**37.6**	**461**	**76.7**	**310**	**51.6**	**291**	**48.4**	**601**	**100.0**

Market Capitalization	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	29	14.6	24	12.1	53	26.6	74	37.2	72	36.2	146	73.4	103	51.8	96	48.2	199	33.1
Between $140 million & $280 million	28	13.2	27	12.7	55	25.9	81	38.2	76	35.8	157	74.1	109	51.4	103	48.6	212	35.3
Less than $140 million	18	9.5	14	7.4	32	16.8	80	42.1	78	41.1	158	83.2	98	51.6	92	48.4	190	31.6
Total	**75**	**12.5**	**65**	**10.8**	**140**	**23.3**	**235**	**39.1**	**226**	**37.6**	**461**	**76.7**	**310**	**51.6**	**291**	**48.4**	**601**	**100.0**

Cross-Sectional Statistics	All
Average	0.00177
Median	0.00034
Standard Deviation	0.01697
Weighted Average	0.00017
Aggregate T-statistics	0.81956

Panel C: ϕ_i

Industry	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	10	5.7	26	14.9	36	20.7	66	37.9	72	41.4	138	79.3	76	43.7	98	56.3	174	28.9
Materials	6	4.5	18	13.6	24	18.2	50	37.9	58	43.9	108	81.8	56	42.4	76	57.6	132	21.9
Industrials	8	11.9	8	11.9	16	23.9	28	41.8	23	34.3	51	76.1	36	53.7	31	46.3	67	11.1
Consumer Discretionary	4	7.1	3	5.4	7	12.5	20	35.7	29	51.8	49	87.5	24	42.9	32	57.1	56	9.3
Consumer Staples	0	0.0	2	11.8	2	11.8	9	52.9	6	35.3	15	88.2	9	52.9	8	47.1	17	2.8
Health Care	0	0.0	5	13.9	5	13.9	11	30.6	20	55.6	31	86.1	11	30.6	25	69.4	36	6.0
Financials	5	9.1	9	16.4	14	25.5	19	34.5	22	40.0	41	74.5	24	43.6	31	56.4	55	9.1
Information Technology	4	9.5	4	9.5	8	19.0	12	28.6	22	52.4	34	81.0	16	38.1	26	61.9	42	7.0
Telecommunication Services	0	0.0	1	16.7	1	16.7	2	33.3	3	50.0	5	83.3	2	33.3	4	66.7	6	1.0
Utilities	1	5.9	2	11.8	3	17.6	8	47.1	6	35.3	14	82.4	9	52.9	8	47.1	17	2.8
Total	**38**	**6.3**	**78**	**13.0**	**116**	**19.3**	**225**	**37.4**	**261**	**43.4**	**486**	**80.7**	**263**	**43.7**	**339**	**56.3**	**602**	**100.0**

Market Capitalization	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	14	7.0	29	14.6	43	21.6	67	33.7	89	44.7	156	78.4	81	40.7	118	59.3	199	33.1
Between $140 million & $280 million	15	7.0	25	11.7	40	18.8	87	40.8	86	40.4	173	81.2	102	47.9	111	52.1	213	35.4
Less than $140 million	9	4.7	24	12.6	33	17.4	71	37.4	86	45.3	157	82.6	80	42.1	110	57.9	190	31.6
Total	**38**	**6.3**	**78**	**13.0**	**116**	**19.3**	**225**	**37.4**	**261**	**43.4**	**486**	**80.7**	**263**	**43.7**	**339**	**56.3**	**602**	**100.0**

Cross-Sectional Statistics	All
Average	-0.09773
Median	-0.03719
Standard Deviation	0.46310
Weighted Average	-0.00407
Aggregate T-statistics	-2.17568

Appendix VII

Cross-sectional Results of Daily Return Market Model: with Ten Industrial Indexes for Deletions

We estimate the following E-GARCH model

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \sum_{k=1}^{10} \delta_{i,k} r_{k,t} + \lambda_{i,1} ANN_{i,t} + \lambda_{i,2} EFF_{i,t} + \varepsilon_{i,t}$$

$$\ln(\sigma_{i,t}^2) = w_i + \varphi_i \ln(\sigma_{i,t-1}^2) + \theta_i \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} + \delta_i \left| \frac{\varepsilon_{i,t-1}}{\sigma_{i,t-1}} \right| + \phi_i POSTANN_{i,t}$$

This table summarize the results for $\lambda_{i,1}$, $\lambda_{i,2}$ and ϕ_i from the above estimated time series model for stocks listed under Deletions from the List of Securities Eligible for Reduced Margin (the list). The stock sample covers the period June 30, 2000 to July 5, 2007. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The definitions of the variables in the model are as follows: $r_{i,t}$ is the return on observation i during day t. $r_{m,t}$ is the return during day t on the CFMRC Index for securities with per share price above $2. $r_{k,t}$ is the return on sector portfolio k for day t. $\varepsilon_{i,t}$ is the zero-mean disturbance. $\sigma_{i,t}^2$ is the conditional variance of the return of firm i at time t. $ANN_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change announcement date and zero elsewhere. $EFF_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change effective date and zero elsewhere. $POSTANN_{i,t}$ take the value 1 starting one day before the margin change announcement date and onward and zero elsewhere. The first part of each panel categorized the estimated coefficients by the sign and significance and reports the number of the estimated coefficients in each category and the respective percentage within a given industry sector. The significance of the estimated coefficients is determined by t-statistic at 5% significance level. The second part of each panel is reported in the same format as the first part. The third part of each panel reports the cross-sectional statistics. The aggregate t-statistics is computed as follow: $\sum w_i \hat{\gamma}_i / \sqrt{\sum w_i^2 var(\hat{\gamma}_i)}$,where $w_i = [var(\hat{\gamma}_i)]^{-1} / \sum [var(\hat{\gamma}_i)]^{-1}$ and $var(\hat{\gamma}_i)$ is the square of the standard error of the estimated parameter in the time series regression. Weighted Average is refer to $\sum w_i \hat{\gamma}_i$.

Panel A: $\lambda_{i,1}$

Industry	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	3	13.6	6	27.3	9	40.9	10	45.5	3	13.6	13	59.1	13	59.1	9	40.9	22	17.1
Materials	2	8.0	1	4.0	3	12.0	11	44.0	11	44.0	22	88.0	13	52.0	12	48.0	25	19.4
Industrials	3	23.1	1	7.7	4	30.8	6	46.2	3	23.1	9	69.2	9	69.2	4	30.8	13	10.1
Consumer Discretionary	0	0.0	2	13.3	2	13.3	8	53.3	5	33.3	13	86.7	8	53.3	7	46.7	15	11.6
Consumer Staples	1	14.3	1	14.3	2	28.6	3	42.9	2	28.6	5	71.4	4	57.1	3	42.9	7	5.4
Health Care	3	18.8	3	18.8	6	37.5	4	25.0	6	37.5	10	62.5	7	43.8	9	56.3	16	12.4
Financials	1	7.1	1	7.1	2	14.3	8	57.1	4	28.6	12	85.7	9	64.3	5	35.7	14	10.9
Information Technology	0	0.0	0	0.0	0	0.0	8	66.7	4	33.3	12	100.0	8	66.7	4	33.3	12	9.3
Telecommunication Services	0	0.0	0	0.0	0	0.0	1	50.0	1	50.0	2	100.0	1	50.0	1	50.0	2	1.6
Utilities	0	0.0	0	0.0	0	0.0	2	66.7	1	33.3	3	100.0	2	66.7	1	33.3	3	2.3
Total	**13**	**10.1**	**15**	**11.6**	**28**	**21.7**	**61**	**47.3**	**40**	**31.0**	**101**	**78.3**	**74**	**57.4**	**55**	**42.6**	**129**	**100.0**

Market Capitalization	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	3	8.6	3	8.6	6	17.1	22	62.9	7	20.0	29	82.9	25	71.4	10	28.6	35	27.1
Between $140 million & $280 million	7	20.6	3	8.8	10	29.4	16	47.1	8	23.5	24	70.6	23	67.6	11	32.4	34	26.4
Less than $140 million	3	5.0	9	15.0	12	20.0	23	38.3	25	41.7	48	80.0	26	43.3	34	56.7	60	46.5
Total	**13**	**10.1**	**15**	**11.6**	**28**	**21.7**	**61**	**47.3**	**40**	**31.0**	**101**	**78.3**	**74**	**57.4**	**55**	**42.6**	**129**	**100.0**

Cross-Sectional Statistics	All
Average	0.00034
Median	0.00084
Standard Deviation	0.02398
Weighted Average	-0.00062
Aggregate T-statistics	-1.34530

Panel B: $\lambda_{i,2}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	3	13.6	2	9.1	5	22.7	10	45.5	7	31.8	17	77.3	13	59.1	9	40.9	22	17.1
Materials	5	20.0	0	0.0	5	20.0	14	56.0	6	24.0	20	80.0	19	76.0	6	24.0	25	19.4
Industrials	3	23.1	2	15.4	5	38.5	7	53.8	1	7.7	8	61.5	10	76.9	3	23.1	13	10.1
Consumer Discretionary	2	13.3	2	13.3	4	26.7	4	26.7	7	46.7	11	73.3	6	40.0	9	60.0	15	11.6
Consumer Staples	0	0.0	1	14.3	1	14.3	4	57.1	2	28.6	6	85.7	4	57.1	3	42.9	7	5.4
Health Care	2	12.5	2	12.5	4	25.0	8	50.0	4	25.0	12	75.0	10	62.5	6	37.5	16	12.4
Financials	1	7.1	0	0.0	1	7.1	5	35.7	8	57.1	13	92.9	6	42.9	8	57.1	14	10.9
Information Technology	1	8.3	1	8.3	2	16.7	4	33.3	6	50.0	10	83.3	5	41.7	7	58.3	12	9.3
Telecommunication Services	0	0.0	0	0.0	0	0.0	2	100.0	0	0.0	2	100.0	2	100.0	0	0.0	2	1.6
Utilities	0	0.0	0	0.0	0	0.0	1	33.3	2	66.7	3	100.0	1	33.3	2	66.7	3	2.3
Total	**17**	**13.2**	**10**	**7.8**	**27**	**20.9**	**59**	**45.7**	**43**	**33.3**	**102**	**79.1**	**76**	**58.9**	**53**	**41.1**	**129**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	5	14.3	2	5.7	7	20.0	13	37.1	15	42.9	28	80.0	18	51.4	17	48.6	35	27.1
Between $140 million & $280 million	4	11.8	2	5.9	6	17.6	16	47.1	12	35.3	28	82.4	20	58.8	14	41.2	34	26.4
Less than $140 million	8	13.3	6	10.0	14	23.3	30	50.0	16	26.7	46	76.7	38	63.3	22	36.7	60	46.5
Total	**17**	**13.2**	**10**	**7.8**	**27**	**20.9**	**59**	**45.7**	**43**	**33.3**	**102**	**79.1**	**76**	**58.9**	**53**	**41.1**	**129**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00484
Median	0.00139
Standard Deviation	0.02244
Weighted Average	0.00034
Aggregate T-statistics	0.68816

Panel C: ϕ_i

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	3	13.6	6	27.3	9	40.9	6	27.3	7	31.8	13	59.1	9	40.9	13	59.1	22	17.1
Materials	1	4.0	5	20.0	6	24.0	9	36.0	10	40.0	19	76.0	10	40.0	15	60.0	25	19.4
Industrials	0	0.0	1	7.7	1	7.7	4	30.8	8	61.5	12	92.3	4	30.8	9	69.2	13	10.1
Consumer Discretionary	0	0.0	3	20.0	3	20.0	3	20.0	9	60.0	12	80.0	3	20.0	12	80.0	15	11.6
Consumer Staples	0	0.0	1	14.3	1	14.3	3	42.9	3	42.9	6	85.7	3	42.9	4	57.1	7	5.4
Health Care	4	25.0	2	12.5	6	37.5	5	31.3	5	31.3	10	62.5	9	56.3	7	43.8	16	12.4
Financials	2	14.3	3	21.4	5	35.7	4	28.6	5	35.7	9	64.3	6	42.9	8	57.1	14	10.9
Information Technology	2	16.7	1	8.3	3	25.0	2	16.7	7	58.3	9	75.0	4	33.3	8	66.7	12	9.3
Telecommunication Services	0	0.0	0	0.0	0	0.0	1	50.0	1	50.0	2	100.0	1	50.0	1	50.0	2	1.6
Utilities	0	0.0	1	33.3	1	33.3	0	0.0	2	66.7	2	66.7	0	0.0	3	100.0	3	2.3
Total	**12**	**9.3**	**23**	**17.8**	**35**	**27.1**	**37**	**28.7**	**57**	**44.2**	**94**	**72.9**	**49**	**38.0**	**80**	**62.0**	**129**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	3	8.6	10	28.6	13	37.1	8	22.9	14	40.0	22	62.9	11	31.4	24	68.6	35	27.1
Between $140 million & $280 million	5	14.7	9	26.5	14	41.2	5	14.7	15	44.1	20	58.8	10	29.4	24	70.6	34	26.4
Less than $140 million	4	6.7	4	6.7	8	13.3	24	40.0	28	46.7	52	86.7	28	46.7	32	53.3	60	46.5
Total	**12**	**9.3**	**23**	**17.8**	**35**	**27.1**	**37**	**28.7**	**57**	**44.2**	**94**	**72.9**	**49**	**38.0**	**80**	**62.0**	**129**	**100.0**

Cross-Sectional Statistics	**All**
Average	-0.14994
Median	-0.09565
Standard Deviation	0.48164
Weighted Average	-0.02384
Aggregate T-statistics	-5.36889

Appendix VIII

Cross-sectional Results of Daily Return Market Model (GJR-GARCH) for Additions

We estimate the following GJR-GARCH model

$$r_{i,t} = \alpha_i + \beta_{i,} r_{m,t} + \lambda_{i,1} ANN_{i,t} + \lambda_{i,2} EFF_{i,t} + \varepsilon_{i,t},$$

$$\sigma_{i,t}^2 = w_i + \varphi_i \sigma_{i,t-1}^2 + \theta_i \varepsilon_{i,t-1}^2 + \delta_i |\varepsilon_{i,t-1}| + \phi_i POSTANN_{i,t}$$

This table summarize the results for $\lambda_{i,1}$, $\lambda_{i,2}$ and ϕ_i from the above estimated time series model for stocks listed under Additions from the List of Securities Eligible for Reduced Margin (the list). The stock sample covers the period June 30, 2000 to July 5, 2007. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The definitions of the variables in the model are as follows: $r_{i,t}$ is the return on observation i during day t. $r_{m,t}$ is the return during day t on the CFMRC Index for securities with per share price above $2. $\varepsilon_{i,t}$ is the zero-mean disturbance. $\sigma_{i,t}^2$ is the conditional variance of the return of firm i at time t. $ANN_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change announcement date and zero elsewhere. $EFF_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change effective date and zero elsewhere. $POSTANN_{i,t}$ take the value 1 starting one day before the margin change announcement date and onward and zero elsewhere. The first part of each panel categorized the estimated coefficients by the sign and significance and reports the number of the estimated coefficients in each category and the respective percentage within a given industry sector. The significance of the estimated coefficients is determined by t-statistic at 5% significance level. The second part of each panel is reported in the same format as the first part. The third part of each panel reports the cross-sectional statistics. The aggregate t-statistics is computed as follow: $\sum w_i \hat{\gamma}_i / \sqrt{\sum w_i^2 var(\hat{\gamma}_i)}$,where $w_i = [var(\hat{\gamma}_i)]^{-1} / \sum [var(\hat{\gamma}_i)]^{-1}$ and $var(\hat{\gamma}_i)$ is the square of the standard error of the estimated parameter in the time series regression. Weighted Average is refer to $\sum w_i \hat{\gamma}_i$.

Panel A: $\lambda_{i,1}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	14	7.6	24	13.0	38	20.5	67	36.2	80	43.2	147	79.5	81	43.8	104	56.2	185	28.1
Materials	16	10.9	19	12.9	35	23.8	61	41.5	51	34.7	112	76.2	77	52.4	70	47.6	147	22.3
Industrials	11	14.7	8	10.7	19	25.3	30	40.0	26	34.7	56	74.7	41	54.7	34	45.3	75	11.4
Consumer Discretionary	5	8.3	8	13.3	13	21.7	15	25.0	32	53.3	47	78.3	20	33.3	40	66.7	60	9.1
Consumer Staples	1	5.0	4	20.0	5	25.0	7	35.0	8	40.0	15	75.0	8	40.0	12	60.0	20	3.0
Health Care	3	7.1	6	14.3	9	21.4	11	26.2	22	52.4	33	78.6	14	33.3	28	66.7	42	6.4
Financials	4	6.9	4	6.9	8	13.8	27	46.6	23	39.7	50	86.2	31	53.4	27	46.6	58	8.8
Information Technology	3	6.7	3	6.7	6	13.3	18	40.0	21	46.7	39	86.7	21	46.7	24	53.3	45	6.8
Telecommunication Services	0	0.0	1	14.3	1	14.3	2	28.6	4	57.1	6	85.7	2	28.6	5	71.4	7	1.1
Utilities	4	21.1	0	0.0	4	21.1	7	36.8	8	42.1	15	78.9	11	57.9	8	42.1	19	2.9
Total	**61**	**9.3**	**77**	**11.7**	**138**	**21.0**	**245**	**37.2**	**275**	**41.8**	**520**	**79.0**	**306**	**46.5**	**352**	**53.5**	**658**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	13	5.8	25	11.2	38	17.0	88	39.5	97	43.5	185	83.0	101	45.3	122	54.7	223	33.9
Between $140 million & $280 million	24	10.3	27	11.6	51	22.0	82	35.3	99	42.7	181	78.0	106	45.7	126	54.3	232	35.3
Less than $140 million	24	11.8	25	12.3	49	24.1	75	36.9	79	38.9	154	75.9	99	48.8	104	51.2	203	30.9
Total	**61**	**9.3**	**77**	**11.7**	**138**	**21.0**	**245**	**37.2**	**275**	**41.8**	**520**	**79.0**	**306**	**46.5**	**352**	**53.5**	**658**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00107
Median	-0.00066
Standard Deviation	0.01678
Weighted Average	-0.00103
Aggregate T-statistics	-6.50288

Panel B: $\lambda_{i,2}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	26	14.1	17	9.2	43	23.2	72	38.9	70	37.8	142	76.8	98	53.0	87	47.0	185	28.1
Materials	13	8.8	28	19.0	41	27.9	56	38.1	50	34.0	106	72.1	69	46.9	78	53.1	147	22.3
Industrials	5	6.7	8	10.7	13	17.3	25	33.3	37	49.3	62	82.7	30	40.0	45	60.0	75	11.4
Consumer Discretionary	6	10.0	6	10.0	12	20.0	27	45.0	21	35.0	48	80.0	33	55.0	27	45.0	60	9.1
Consumer Staples	2	10.0	3	15.0	5	25.0	8	40.0	7	35.0	15	75.0	10	50.0	10	50.0	20	3.0
Health Care	7	16.7	4	9.5	11	26.2	15	35.7	16	38.1	31	73.8	22	52.4	20	47.6	42	6.4
Financials	7	12.1	8	13.8	15	25.9	26	44.8	17	29.3	43	74.1	33	56.9	25	43.1	58	8.8
Information Technology	4	8.9	9	20.0	13	28.9	15	33.3	17	37.8	32	71.1	19	42.2	26	57.8	45	6.8
Telecommunication Services	1	14.3	0	0.0	1	14.3	4	57.1	2	28.6	6	85.7	5	71.4	2	28.6	7	1.1
Utilities	4	21.1	2	10.5	6	31.6	7	36.8	6	31.6	13	68.4	11	57.9	8	42.1	19	2.9
Total	**75**	**11.4**	**85**	**12.9**	**160**	**24.3**	**255**	**38.8**	**243**	**36.9**	**498**	**75.7**	**330**	**50.2**	**328**	**49.8**	**658**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	28	12.6	39	17.5	67	30.0	85	38.1	71	31.8	156	70.0	113	50.7	110	49.3	223	33.9
Between $140 million & $280 million	25	10.8	32	13.8	57	24.6	93	40.1	82	35.3	175	75.4	118	50.9	114	49.1	232	35.3
Less than $140 million	22	10.8	14	6.9	36	17.7	77	37.9	90	44.3	167	82.3	99	48.8	104	51.2	203	30.9
Total	**75**	**11.4**	**85**	**12.9**	**160**	**24.3**	**255**	**38.8**	**243**	**36.9**	**498**	**75.7**	**330**	**50.2**	**328**	**49.8**	**658**	**100.0**

Cross-Sectional Statistics	**All**
Average	0.00148
Median	0.00003
Standard Deviation	0.01680
Weighted Average	0.00020
Aggregate T-statistics	1.28896

Panel C: ϕ_i

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	12	6.5	21	11.4	33	17.8	67	36.2	85	45.9	152	82.2	79	42.7	106	57.3	185	28.2
Materials	7	4.8	21	14.4	28	19.2	49	33.6	69	47.3	118	80.8	56	38.4	90	61.6	146	22.3
Industrials	6	8.1	5	6.8	11	14.9	31	41.9	32	43.2	63	85.1	37	50.0	37	50.0	74	11.3
Consumer Discretionary	4	6.7	6	10.0	10	16.7	22	36.7	28	46.7	50	83.3	26	43.3	34	56.7	60	9.1
Consumer Staples	0	0.0	1	5.0	1	5.0	10	50.0	9	45.0	19	95.0	10	50.0	10	50.0	20	3.0
Health Care	0	0.0	2	4.8	2	4.8	12	28.6	28	66.7	40	95.2	12	28.6	30	71.4	42	6.4
Financials	4	6.9	6	10.3	10	17.2	22	37.9	26	44.8	48	82.8	26	44.8	32	55.2	58	8.8
Information Technology	1	2.2	5	11.1	6	13.3	14	31.1	25	55.6	39	86.7	15	33.3	30	66.7	45	6.9
Telecommunication Services	0	0.0	3	42.9	3	42.9	1	14.3	3	42.9	4	57.1	1	14.3	6	85.7	7	1.1
Utilities	1	5.3	2	10.5	3	15.8	7	36.8	9	47.4	16	84.2	8	42.1	11	57.9	19	2.9
Total	**35**	**5.3**	**72**	**11.0**	**107**	**16.3**	**235**	**35.8**	**314**	**47.9**	**549**	**83.7**	**270**	**41.2**	**386**	**58.8**	**656**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	12	5.4	27	12.2	39	17.6	73	32.9	110	49.5	183	82.4	85	38.3	137	61.7	222	33.8
Between $140 million & $280 million	10	4.3	23	10.0	33	14.3	95	41.1	103	44.6	198	85.7	105	45.5	126	54.5	231	35.2
Less than $140 million	13	6.4	22	10.8	35	17.2	67	33.0	101	49.8	168	82.8	80	39.4	123	60.6	203	30.9
Total	**35**	**5.3**	**72**	**11.0**	**107**	**16.3**	**235**	**35.8**	**314**	**47.9**	**549**	**83.7**	**270**	**41.2**	**386**	**58.8**	**656**	**100.0**

Cross-Sectional Statistics	**All**
Average	-0.00006
Median	-0.00001
Standard Deviation	0.00028
Weighted Average	0.00000
Aggregate T-statistics	-78.11402

Appendix IX
Cross-sectional Results of Daily Return Market Model (GJR-GARCH) for Deletions

We estimate the following GJR-GARCH model

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \lambda_{i,1} ANN_{i,t} + \lambda_{i,2} EFF_{i,t} + \varepsilon_{i,t},$$

$$\sigma_{i,t}^2 = w_i + \varphi_i \sigma_{i,t-1}^2 + \theta_i \varepsilon_{i,t-1}^2 + \delta_i |\varepsilon_{i,t-1}| + \phi_i POSTANN_{i,t}$$

This table summarize the results for $\lambda_{i,1}$, $\lambda_{i,2}$ and ϕ_i from the above estimated time series model for stocks listed under Deletions from the List of Securities Eligible for Reduced Margin (the list). The stock sample covers the period June 30, 2000 to July 5, 2007. Each observation of the stock sample contains daily return six months prior to and after the announcement date of the list, including up to 254 days of stock returns. The definitions of the variables in the model are as follows: $r_{i,t}$ is the return on observation i during day t. $r_{m,t}$ is the return during day t on the CFMRC Index for securities with per share price above $2. $\varepsilon_{i,t}$ is the zero-mean disturbance. $\sigma_{i,t}^2$ is the conditional variance of the return of firm i at time t. $ANN_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change announcement date and zero elsewhere. $EFF_{i,t}$ is a dummy variable for observation i that take the value 1 the day before, the day of and the day after the margin change effective date and zero elsewhere. $POSTANN_{i,t}$ take the value 1 starting one day before the margin change announcement date and onward and zero elsewhere. The first part of each panel categorized the estimated coefficients by the sign and significance and reports the number of the estimated coefficients in each category and the respective percentage within a given industry sector. The significance of the estimated coefficients is determined by t-statistic at 5% significance level. The second part of each panel is reported in the same format as the first part. The third part of each panel reports the cross-sectional statistics. The aggregate t-statistics is computed as follow: $\sum w_i \hat{\gamma}_i / \sqrt{\sum w_i^2 var(\hat{\gamma}_i)}$,where $w_i = [var(\hat{\gamma}_i)]^{-1} / \sum [var(\hat{\gamma}_i)]^{-1}$ and $var(\hat{\gamma}_i)$ is the square of the standard error of the estimated parameter in the time series regression. Weighted Average is refer to $\sum w_i \hat{\gamma}_i$.

Panel A: $\lambda_{i,1}$

Industry	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	2	8.0	3	12.0	5	20.0	14	56.0	6	24.0	20	80.0	16	64.0	9	36.0	25	17.2
Materials	2	8.3	4	16.7	6	25.0	9	37.5	9	37.5	18	75.0	11	45.8	13	54.2	24	16.6
Industrials	1	5.6	0	0.0	1	5.6	11	61.1	6	33.3	17	94.4	12	66.7	6	33.3	18	12.4
Consumer Discretionary	0	0.0	3	16.7	3	16.7	7	38.9	8	44.4	15	83.3	7	38.9	11	61.1	18	12.4
Consumer Staples	0	0.0	2	50.0	2	50.0	1	25.0	1	25.0	2	50.0	1	25.0	3	75.0	4	2.8
Health Care	2	11.1	4	22.2	6	33.3	4	22.2	8	44.4	12	66.7	6	33.3	12	66.7	18	12.4
Financials	2	11.8	3	17.6	5	29.4	5	29.4	7	41.2	12	70.6	7	41.2	10	58.8	17	11.7
Information Technology	2	13.3	0	0.0	2	13.3	7	46.7	6	40.0	13	86.7	9	60.0	6	40.0	15	10.3
Telecommunication Services	0	0.0	0	0.0	0	0.0	1	33.3	2	66.7	3	100.0	1	33.3	2	66.7	3	2.1
Utilities	1	33.3	0	0.0	1	33.3	2	66.7	0	0.0	2	66.7	3	100.0	0	0.0	3	2.1
Total	**12**	**8.3**	**19**	**13.1**	**31**	**21.4**	**61**	**42.1**	**53**	**36.6**	**114**	**78.6**	**73**	**50.3**	**72**	**49.7**	**145**	**100.0**

Market Capitalization	**Significant**						**Insignificant**						**All**					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	1	2.7	2	5.4	3	8.1	24	64.9	10	27.0	34	91.9	25	67.6	12	32.4	37	25.5
Between $140 million & $280 million	5	12.5	7	17.5	12	30.0	12	30.0	16	40.0	28	70.0	17	42.5	23	57.5	40	27.6
Less than $140 million	6	8.8	10	14.7	16	23.5	25	36.8	27	39.7	52	76.5	31	45.6	37	54.4	68	46.9
Total	**12**	**8.3**	**19**	**13.1**	**31**	**21.4**	**61**	**42.1**	**53**	**36.6**	**114**	**78.6**	**73**	**50.3**	**72**	**49.7**	**145**	**100.0**

Cross-Sectional Statistics	**All**
Average	-0.00006
Median	0.00028
Standard Deviation	0.02430
Weighted Average	-0.00221
Aggregate T-statistics	-6.32937

Panel B: $\lambda_{i,2}$

Industry	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	3	12.0	3	12.0	6	24.0	11	44.0	8	32.0	19	76.0	14	56.0	11	44.0	25	17.2
Materials	3	12.5	1	4.2	4	16.7	10	41.7	10	41.7	20	83.3	13	54.2	11	45.8	24	16.6
Industrials	2	11.1	2	11.1	4	22.2	8	44.4	6	33.3	14	77.8	10	55.6	8	44.4	18	12.4
Consumer Discretionary	1	5.6	2	11.1	3	16.7	5	27.8	10	55.6	15	83.3	6	33.3	12	66.7	18	12.4
Consumer Staples	0	0.0	1	25.0	1	25.0	2	50.0	1	25.0	3	75.0	2	50.0	2	50.0	4	2.8
Health Care	3	16.7	2	11.1	5	27.8	7	38.9	6	33.3	13	72.2	10	55.6	8	44.4	18	12.4
Financials	2	11.8	1	5.9	3	17.6	3	17.6	11	64.7	14	82.4	5	29.4	12	70.6	17	11.7
Information Technology	3	20.0	1	6.7	4	26.7	5	33.3	6	40.0	11	73.3	8	53.3	7	46.7	15	10.3
Telecommunication Services	0	0.0	0	0.0	0	0.0	3	100.0	0	0.0	3	100.0	3	100.0	0	0.0	3	2.1
Utilities	0	0.0	0	0.0	0	0.0	1	33.3	2	66.7	3	100.0	1	33.3	2	66.7	3	2.1
Total	**17**	**11.7**	**13**	**9.0**	**30**	**20.7**	**55**	**37.9**	**60**	**41.4**	**115**	**79.3**	**72**	**49.7**	**73**	**50.3**	**145**	**100.0**

Market Capitalization	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	6	16.2	1	2.7	7	18.9	12	32.4	18	48.6	30	81.1	18	48.6	19	51.4	37	25.5
Between $140 million & $280 million	5	12.5	4	10.0	9	22.5	13	32.5	18	45.0	31	77.5	18	45.0	22	55.0	40	27.6
Less than $140 million	6	8.8	8	11.8	14	20.6	30	44.1	24	35.3	54	79.4	36	52.9	32	47.1	68	46.9
Total	**17**	**11.7**	**13**	**9.0**	**30**	**20.7**	**55**	**37.9**	**60**	**41.4**	**115**	**79.3**	**72**	**49.7**	**73**	**50.3**	**145**	**100.0**

Cross-Sectional Statistics	All
Average	0.00293
Median	-0.00024
Standard Deviation	0.02279
Weighted Average	0.00071
Aggregate T-statistics	2.13919

Panel C: ϕ_i

Industry	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Energy	0	0.0	1	4.0	1	4.0	8	32.0	16	64.0	24	96.0	8	32.0	17	68.0	25	17.2
Materials	1	4.2	5	20.8	6	25.0	8	33.3	10	41.7	18	75.0	9	37.5	15	62.5	24	16.6
Industrials	3	16.7	3	16.7	6	33.3	7	38.9	5	27.8	12	66.7	10	55.6	8	44.4	18	12.4
Consumer Discretionary	1	5.6	1	5.6	2	11.1	4	22.2	12	66.7	16	88.9	5	27.8	13	72.2	18	12.4
Consumer Staples	0	0.0	0	0.0	0	0.0	2	50.0	2	50.0	4	100.0	2	50.0	2	50.0	4	2.8
Health Care	2	11.1	3	16.7	5	27.8	7	38.9	6	33.3	13	72.2	9	50.0	9	50.0	18	12.4
Financials	2	11.8	3	17.6	5	29.4	7	41.2	5	29.4	12	70.6	9	52.9	8	47.1	17	11.7
Information Technology	1	6.7	2	13.3	3	20.0	3	20.0	9	60.0	12	80.0	4	26.7	11	73.3	15	10.3
Telecommunication Services	1	33.3	0	0.0	1	33.3	1	33.3	1	33.3	2	66.7	2	66.7	1	33.3	3	2.1
Utilities	0	0.0	1	33.3	1	33.3	1	33.3	1	33.3	2	66.7	1	33.3	2	66.7	3	2.1
Total	**11**	**7.6**	**19**	**13.1**	**30**	**20.7**	**48**	**33.1**	**67**	**46.2**	**115**	**79.3**	**59**	**40.7**	**86**	**59.3**	**145**	**100.0**

Market Capitalization	Significant						Insignificant						All					
	Positive		Negative		Total		Positive		Negative		Total		Positive		Negative		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Larger than $280 million	1	2.7	5	13.5	6	16.2	12	32.4	19	51.4	31	83.8	13	35.1	24	64.9	37	25.5
Between $140 million & $280 million	5	12.5	5	12.5	10	25.0	13	32.5	17	42.5	30	75.0	18	45.0	22	55.0	40	27.6
Less than $140 million	5	7.4	9	13.2	14	20.6	23	33.8	31	45.6	54	79.4	28	41.2	40	58.8	68	46.9
Total	**11**	**7.6**	**19**	**13.1**	**30**	**20.7**	**48**	**33.1**	**67**	**46.2**	**115**	**79.3**	**59**	**40.7**	**86**	**59.3**	**145**	**100.0**

Cross-Sectional Statistics	All
Average	-0.00009
Median	-0.00003
Standard Deviation	0.00063
Weighted Average	-0.00001
Aggregate T-statistics	-60.09656